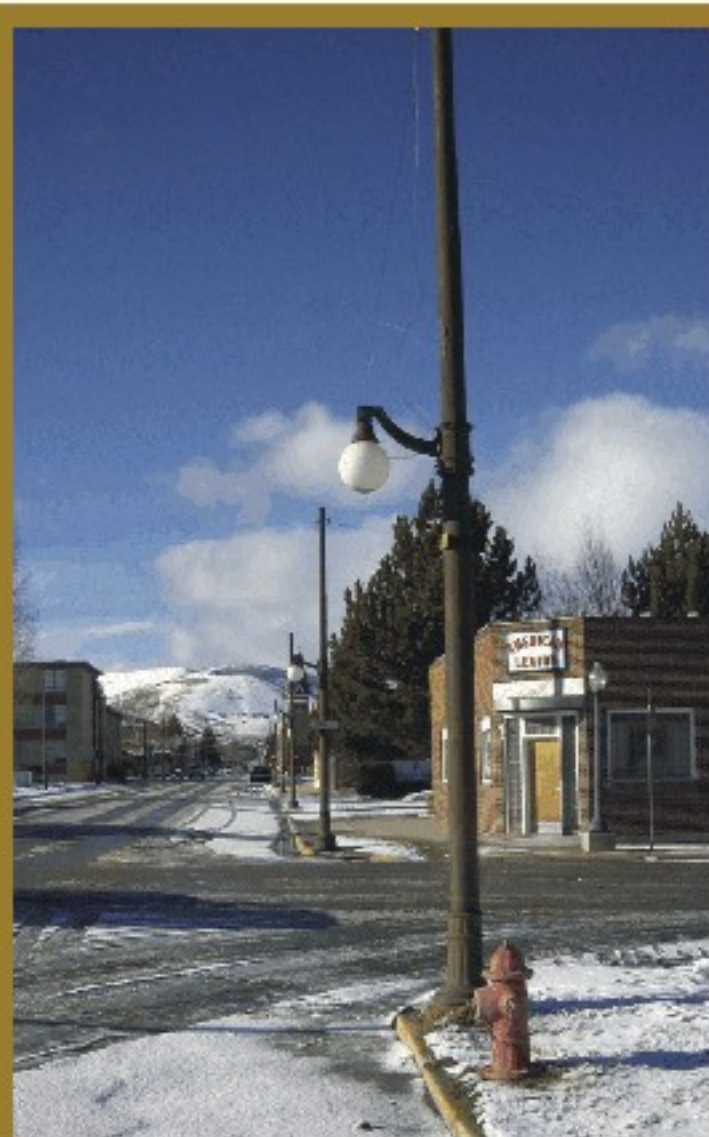


MDOJ Natural Resource Damage Program
Upper Clark Fork River Basin Restoration Fund

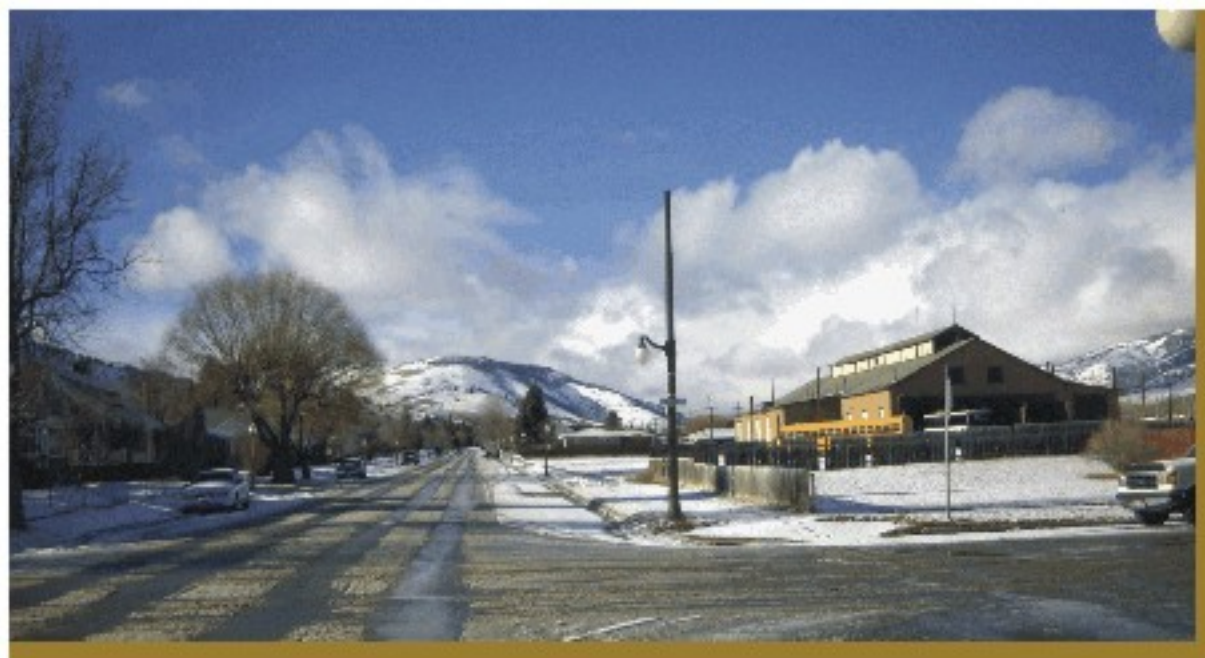
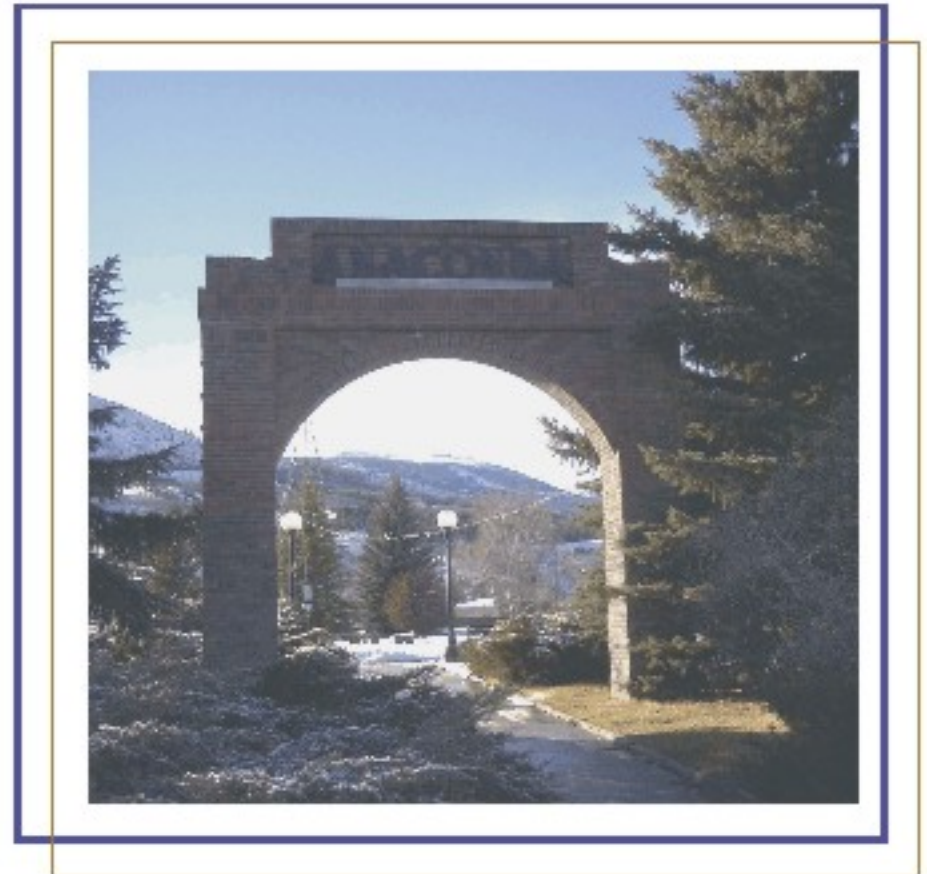
East Third Street & South Birch Water Main Replacements

Long Form Restoration Grant Application
submitted by

**ANACONDA-DEER LODGE
COUNTY**



**submitted
March 3, 2006**



Step 1. Applicant Information and Project Summary Form

1. Name of Applicant(s) Anaconda-Deer Lodge County
2. Project Title East Third Street and South Birch Water Main Replacements
3. Type of Entity* City-County Consolidated Government
(city, corporation, private individual, association, etc.)

(***Corporation** and **Foundation** applicants are required to submit corporation information as follows: Articles of Incorporation, and Certificate of Good Standing. **Partnership** applicants are required to submit a Partnership Agreement and a list of the names of the Partners. **Limited Liability Company** applicants are required to submit Articles of Organization, a list of the members/managers, and Certificate of Good Standing. **Associations** are required to submit a list of members, Articles of Incorporation and Certificate of Organization. **Please attach these documents to this form.**)

4. Description of Project Location (Attach map showing location.) East Third Street corridor between Main Street and Monroe Street, and Birch Street corridor south of Eighth Street.
5. Injured Natural Resource(s) and/or Impaired Services to be Restored, Rehabilitated, Replaced or Equivalent Acquired through Project Replace leaking water distribution mains to extend existing water supply and offset lost (contaminated) groundwater resources.
6. Authorized Representative: Rebecca Guay Chief Executive
(Name) (Title)
Mailing Address: County Courthouse, 800 South Main
(Street/PO Box)
Anaconda, MT 59711 406/563-4000
(City/State/Zip) (Telephone)

Contact Person*: Linda Bouck Planning Director
(Name) (Title)
Mailing Address*: County Courthouse, 800 South Main
(Street/PO Box)
Anaconda, MT 59711
(City/State/Zip)
Phone: 406/563-4010

E-mail Address: plandept@in-tch.com

(*For Corporate, Partnership, L.L.C., or Cooperative Association applicants, list Registered Agent and Office for Service of Process)

7. Proposed Funding Sources

On the table below, enter the source and amount of all funding that may be used for this project. Indicate all potential sources of funds that you intend to apply for this project, even if you have not yet applied for the funds or have not yet received a commitment from the source. Indicate whether matching funds are cash or in-kind.

Funding Source		Amount in (\$) Dollars					Matching Fund Percentage (Funding Source Total/Project Total)
		Committed Funds			Uncommitted Funds	Total	
		Grants	Non-Grant Funds				
			Cash	In-kind			
A.	UCFRB Restoration Fund	\$ 1,964,262.65				\$ 1,964,262.65	96.84%
B.	ADLC			\$ 64,079.59		\$ 64,079.59	3.16%
C.							
D.							
E.							
F.							
G.							
H.							
I.							
Non-NRDP Totals		\$ 1,964,262.65		\$ 64,079.59		\$ 64,079.59	3.16%
8. Estimated Total Project Cost					\$2,028,342.24		
		(Automatically Calculated from spreadsheet above)					

9. Private (non-Governmental) Grant Applicant Financial Information *(not applicable)*

- Are there any lawsuits, judgments, or obligations pending for or against you?

- Have you ever declared bankruptcy? _____
- Are any of your tax returns delinquent or under dispute? _____
- Any unpaid deficiencies? _____
- Are you a party to a lawsuit? _____
- Do you have any other contingent liabilities? _____
- Do your current and deferred liabilities exceed the value of your assets? _____

Explain all YES answers in a statement attached to this form.

10. Certification for Individuals or Private Entities

(not applicable)

Individuals or private entities requesting grant funds must sign the following certification.

Certification for Individuals or Private Entities

I (We) the undersigned, have provided this financial information as part of my (our) application for a grant from the UCFRB Restoration Fund. I (We) certify that the statement is complete and accurate to the best of my (our) knowledge and I (we) authorize the State of Montana to investigate my credit worthiness and any of the matters described above.

Individual(s)

_____	_____	_____	_____
Name	Social Security No.	Signature	Date

_____	_____	_____	_____
Name	Social Security No.	Signature	Date

Social Security Numbers will be kept confidential.

Private Entities

_____	_____	_____	_____
Name of Authorizing Agent	Federal Tax ID No.	Signature	Date

11. Authorizing Statement

An authorized agent/agents representing the applicant must by his/her signature indicate that the application for funds and expenditure of matching funds, as represented, is officially authorized.

Grant Authorization

I hereby declare that the information included in and all attachments to this application are true, complete, and accurate to the best of my knowledge, and that the proposed project complies with all applicable state, local, and federal laws and regulations.

I further declare that, for Anaconda-Deer Lodge County, Montana (Project Sponsor), I am legally authorized to enter into a binding contract with the State of Montana to obtain funding if this application is approved. I understand that the Governor must authorize funding for this project.

<u>Anaconda-Deer Lodge County, Montana</u>	_____
Project Sponsor	Date

_____	<u>Chief Executive</u>
Authorized Representative (signature)	Title

Step 2. Project Abstract

Applicant Name: Anaconda-Deer Lodge County (ADLC)

Project Title: East Third Street and South Birch Water Main Replacements

Project Description and Benefits to Restoration:

Constrained by mining-related groundwater contamination, Anaconda-Deer Lodge County (ADLC) continues its aggressive water main replacement program to reduce leakage as a surrogate for developing addition supply. These endeavors are proposed as “replacement” projects to offset irreparable damage to Anaconda area water resources.

UCFRB Restoration grants have been pivotal to these efforts since 2002, funding the replacement of 31,874 feet of mains to date, beginning with critical transmission mains. But an additional 51,500 feet of century-old, leaking, thin-walled steel distribution mains dating from the era of the Anaconda Company remain in the system. Even with the recent main upgrades, 1.5 mgd of leakage likely remains in the system, or almost one-fourth of the current 6.6 mgd well field supply. Replacement of mains has been prioritized and scheduled in ADLC’s adopted water master plan, the *Municipal Water System Preliminary Engineering Report* (HKM Engineering, 2004).

Following those priorities, ADLC is requesting funding for its fifth consecutive water project. The East Third Street and South Birch upgrade proposes 5,670 feet of replacement using new eight- and six-inch ductile iron pipe, plus a booster pump station on South Birch to address low pressure and loss of service problems. On East Third 16 leaks or repairs are documented in recent years, with one leak alone of 20 gpm. The new mains are estimated to conserve up to 54 million gallons of water per year previously lost to leakage, representing a potential annual cost savings of \$57,800. A post-project Monitoring Plan to reevaluate leakage after the 2003-2007 replacements is included in the project.

No long term adverse environmental impacts are predicted from the project, and substantial permanent benefits to Anaconda’s infrastructure and residents will result. Transient impacts associated with project construction have been identified, and suitable mitigation for these is proposed. The East Third Street corridor contains the rail bed from an abandoned streetcar line, which is expected to result in some RCRA waste handling and disposal from old creosote ties.

The proposed East Third Street and South Birch main replacements are estimated to cost \$2,028,342. ADLC is proposing \$64,080 of in-kind services as match, and has already spent \$5,500 for preliminary engineering to accurately conceptualize the project. Unlike in its past proposals, the City-County is unable to afford an additional cash contribution this year as grant match. This results from the unanticipated reallocation of available cash in its Water Enterprise Fund to reestablish adequate reserves and excess coverage for its 1992 bond issue for well field and storage tank improvements. This corrective fiscal adjustment was required in the wake of a February 2006 audit. ADLC intends to resume significant cash match in its future grant proposals to the NRD Program, and is setting aside \$10,000 per month beginning in March 2006 for that purpose.

This project proposal is an essential next step in Anaconda’s critical water infrastructure upgrades. It represents fiscally and environmentally responsible planning on the part of the City-County to mitigate resource losses due to past mining-related degradation.

Step 3. Technical Narrative

Applicant Name: Anaconda-Deer Lodge County

Project Title: East Third Street and South Birch Water Main Replacements

A. Project Need and Problem Definition

Anaconda-Deer Lodge County (ADLC) inherited a dilapidated public water system from the Butte Water Company, a Washington Corporation subsidiary, in the mid-1990's. Originally constructed by the Anaconda Company and later owned by the Atlantic Richfield Company (ARCO), the system was old and severely undercapitalized when the City-County assumed ownership and operation. ADLC has faced significant challenges to maintain and update its system, both from the standpoints of regulatory compliance and serviceability.

Approximately 6,800 persons are served by the municipal water system. Service is generally confined to Anaconda proper, plus a recent transmission main serving the Warm Springs Campus, and a water service main installed in 2003 with NRD grant funds to serve the Bowman Field airport. Water is supplied by a six-well field west of Anaconda, and a 3.5 million gallon storage tank provides a buffer for peak demands (see **Figure 1**, following page). Options for expanding the supply are limited by historic groundwater contamination. Due to groundwater development limitations in areas surrounding Anaconda from past mining and smelting damage, the City-County government is unable to extend municipal water service to many adjacent outlying areas.

Hence conservation of its finite usable water resources is of paramount importance. Miles of century old water distribution mains remain in service in Anaconda's system, and leakage is acute. It is critical to curtail leakage and extend the utility of the limited available water supply. This is essential to the quality of life in the community, and to accommodate future growth.

ADLC has implemented a program to replace the old leaking mains in its water system. Main replacements and other system needs were prioritized a *Municipal Water System Preliminary Engineering Report* (PER) for the Anaconda System prepared in 2004 by HKM Engineering. The PER was prepared with the full involvement of ADLC and its Water Department staff, and the ADLC Council of Commissioners adopted it by Resolution No. 04-21 on August 3, 2004 (see **Appendix A**).

Since 2002, with the assistance of Upper Clark Fork Basin Restoration Funds, Anaconda has been able to replace its key transmission mains in the water system. The 2003 Main Street, 2004 East Fourth Street, and 2005 West Fourth Street main replacements now provide a reliable core of transmission facilities. Following the template of the PER, ADLC's focus now transitions to distribution main replacements. NRD grant funding awarded in 2005 will now enable the replacement of old distribution mains along Seventh, East Sixth and East Fourth Streets during the 2006 and 2007 construction seasons. Collectively these projects replace 31,874 feet of old transmission and distribution mains. However the PER identified 51,495 additional feet of old mains needing replacement (see **Figure 2**, second page following)

(Insert Figure 1 - Project Location Map)

(Insert Figure 2 - PER Main Replacement Priorities)

Following the Seventh, East Sixth and East Eighth Street mains, the next priority replacements identified in the PER are the Third Street main replacement along with short segments on Cottonwood and Monroe Streets. Alternatively, if water metering proceeds, the PER proposed only West Third Street and simultaneous installation of customer water meters in half of the system (see PER Tables 3-6 and 7-1 reproduced in **Appendix B**). With a metering program, the PER proposed the installation of remaining water meters the following year with short main replacements along Monroe, Cottonwood, Chestnut, and Cherry Streets, followed by the East Third Street main the subsequent year (PER Table 7-1). *[Note that Tables 3-6 and 7-1 in the PER differ by the inclusion of customer metering and a backup generator for the well pumps in the latter. If those additional improvements are implemented by ADLC, it protracts the improvements program by two years in Table 7-1, and HKM Engineering adjusted the scheduling of some main segments accordingly.]*

After deliberation with staff, the ADLC Council of Commissioners decided to make three decisions and adjustments relative to these priorities:

1. In an effort to counter perceived prevalent opposition to (customer) water metering, an aggressive public outreach and education program is considered necessary before system-wide metering can proceed. A 2003 *Community Survey* addressed water metering, and of 17 categorical priorities for municipal improvements polled in the survey, water metering ranked last. Given choices of “more desirable”, “neutral”, and “less desirable”, 85 percent of respondents rated metering “less desirable.” To counter this opposition, 18 months will be allotted for a public education program, from July 2006 through December 2007. Thereafter funding and implementation of full metering will be pursued. Since February 2004, metering has been required by ordinance for all new construction.
2. ADLC initially considered scheduling the replacement of the full length of Third Street in this grant proposal, but the cost of this 26-block undertaking appeared excessive. Upon review of the Water Department’s leak repair work orders along Third Street, the east half of the corridor has been comparatively the greater problem (see **Figure 3**, p. 12 following). Hence ADLC proposes to replace the East Third distribution main ahead of the West Third stretch. Existing East Third mains are six- and eight-inch diameter.
3. ADLC has re-prioritized the replacement of 1½ blocks of existing four-inch main and the addition of a booster pump station on Birch Street, south of Eighth. The pipe replacement was slated for 2010 in Table 3-6 of the PER (see **Appendix B**). High terrain results in chronic low pressure problems for the 15 users along this corridor, especially during high water demand (e.g., summer irrigation) periods. During the 2005 construction of the West Fourth Street transmission main, temporary pressure reductions resulted in complete loss of water service for the two upper residences. This problem is expected to recur during future construction episodes such as the forthcoming Seventh, East Sixth and East Eighth Street main replacements. The need for a booster pump was not known at the time of PER publication. The South Birch Street corridor is shown in **Photos 1 and 2** (following page).

(Insert Photos 1 & 2 showing South Birch corridor, here)

Having adopted the PER in August 2004, the Anaconda Council of Commissioners by Resolution No. 06-07 (adopted February 21, 2006) has amended its water system improvement priorities to reflect the preceding three changes. A copy of Resolution No. 06-07 appears in **Appendix A**. On this basis, ADLC is therefore seeking NRD funding for the East Third Street and South Birch Water Main Replacements in this application. The three components of the proposed project include 12 blocks of replacement main on East Third, between Main and Monroe Streets; the 1½-block main replacement on Birch Street south of Eighth; and a booster pump station on South Birch. East Third replacement main sizes are proposed as eight-inch, and the new South Birch main will be six-inch. Locations appear in **Figure 3** (following page).

Given the age and poor condition of these turn-of-the-century mains, Anaconda would still need to replace these mains irrespective of mining/smelting-related groundwater contamination. The need and resultant benefits of the main replacements are, however, accentuated by the limited options for expanding Anaconda's water supply. Unable to develop additional wells east of the community due to groundwater contamination, **ADLC needs to aggressively curtail leakage in its system to meet its full water demands from its western well field!**

A.1. Problem to be Addressed

The multiple prior owners of Anaconda's water system consistently undercapitalized the utility. As the profitability of its Butte/Anaconda operations waned, the Anaconda Company minimized capital outlays for upgrade and maintenance of those "company" water systems. Under later owners, this trend became so acute with the Butte system that the U.S. Environmental Protection Agency in conjunction with the Montana Department of Environmental Quality (MDEQ) brought suit against Washington Corporation in 1990 to force system upgrades to meet regulatory compliance mandates. Shortly thereafter, Washington Corporation divested itself of the Butte and Anaconda water utilities, and both systems became municipally owned.

When the ADLC assumed ownership of the water utility, it inherited a severely leaking piping system without options to offset leakage by developing additional water supply. A century of mining and smelting activity rendered the bulk of the groundwater in proximity to the community unusable, as evidenced by EPA's "technically infeasible" (to remediate) designation. Alternate surface water resources are remote and likely require filtration treatment. Anaconda, like other communities, must also be able to accommodate growth. Current water supplies are strained, and residents live with seasonal water use restrictions. The water facilities inherited from the Anaconda Company and its successors continue to need significant repair. But leakage losses are more critical in Anaconda's case, because the alternate option of expanding water supplies is severely limited.

Underscoring the acute impacts of leakage in the system are conclusions from the 2004 PER stating:

"The water system losses... amount to approximately 2,183,000 gallons per day.... These losses can be attributed almost entirely to system leakage."
(see PER p. 23 reproduced in **Appendix C**)

It notes **these losses are 76 percent of Anaconda's baseline (non-irrigation) water production!**

(Insert Figure 3 - Project Corridor Map)

A.2. Circumstances Precipitating Project Need

Two significant and related circumstances drive the need for this project:

1. Water mains remaining from the Anaconda Company's original water system leak excessively, wasting up to three-quarters of baseline water production. Exceeding 100 years in age, these mains are cannot be repaired or retained in service cost effectively.
2. Anaconda cannot readily expand its water supply to compensate for these losses.

The old water mains in Anaconda's system are mostly *Kalimane* pipe, a thin-walled galvanized steel product that is vulnerable to corrosive perforation. Some of the existing *Kalimane* pipe relies on poured-in-place lead joints to seal fittings and adjacent pipe sections, which likewise have proven to be leak prone. Such pipe materials were widely used in the original construction of both the Butte and Anaconda water distribution systems. The ADLC Water Department reports significant "pitting" and corrosion of the existing *Kalimane* pipe walls, exacerbated by clay and wet sandy soil conditions.

Expansive groundwater contamination from mining and smelting limits ADLC's ability to develop additional water supply. This contamination renders shallow groundwater aquifers abutting Anaconda to the south and the east unusable. Without such contamination, the community could conceivably compensate for water lost to main leakage by simply adding more wells.

ADLC's ability to add new municipal wells is limited by three major factors:

1. Extensive mining-related groundwater contamination in the surrounding area,
2. Limited and competing water rights, and
3. The cost of transmission from remote locations.

Per **Figure 1** (previous), Dr. Woessner's 1994 delineation of groundwater contamination encroaches on Anaconda proper to the east and south, including the South Birch portion of the project corridors. Since his report, the recent Record of Decision has extended the boundaries of the contamination zone even further, including the northeast flank of the community towards Stuckey Ridge and portions of the Anaconda Uplands to the south. Coupled with covenants with ARCO prohibiting wells and USEPA limitations on further groundwater development, this renders these areas infeasible for new groundwater supply for Anaconda.

Drilling through contaminated (shallow) groundwater zones to reach "deep" aquifers risks poor water quality (high mineralization), technical infeasibility to positively seal off upper aquifers, and non-compliance with *Source Water Protection Delineation* requirements for public water supplies per MDEQ *Circular PWS6*. Deep drilling would also entail significant additional cost. Furthermore, contamination extending into the "bedrock" aquifer(s) is also documented over much of the area, rendering it likewise unfit for potable supply.

Anaconda's current groundwater rights are 5,500 gpm or 7,920,000 gpd (*Draft West Valley Water & Sewer Feasibility Study*, Robert Peccia & Associates, January 2000). Current capacity from ADLC's six (1994) wells is 4,600 gpm or 6,624,000 gpd, leaving 900 gpm in undeveloped rights. However a 1994 agreement with the West Valley Water Users Association limits ADLC's ability to exploit additional groundwater down gradient from West Valley. As shown

in **Figure 1** (previous), West Valley is located immediately west of the Anaconda well field. That well field was sited to avoid groundwater contamination zones on the east side of the community. Alternate locations (north or south) that avoid the contamination are not hydrogeologically productive for municipal-scale wells due to rocky ridges and high elevation terrain.

West Valley has an estimated current population of 1,365 persons and 650 residences (*Draft West Valley Water & Sewer Feasibility Study*), and at least 337 private wells are recorded for the area. Depths range from 42 to 88 feet, similar to ADLC's municipal wells. West Valley average water consumption is projected to reach 400,000 gpd (1.0 mgd maximum day) by the year 2020, and the local users association is very protective of its existing groundwater resources.

As a condition of withdrawing its protest(s) against ADLC's development of a new municipal well field in the mid-1990's, the West Valley Water Users Association negotiated an agreement with ADLC requiring that further groundwater development west of Anaconda must not impact West Valley private wells. Already ADLC has been legally forced to replace two private West Valley wells alleged by their owners to have been impacted by the municipal wells. Adding West Valley water users to Anaconda's municipal system represents the addition of up to 1.0 mgd in water use, additional capacity that ADLC cannot currently provide!

Relative to Anaconda's water supply options, a concern also exists with the proliferation of individual septic systems in the West Valley area, up gradient from the municipal well field. ADLC completed the *Anaconda Well Field Source Water Protection Plan* (Water & Environmental Technologies, LLC, April 2003), in compliance with the Montana Source Water Protection Program and MDEQ *Circular PWS-6*. The study delineated control and protection zones, modeled groundwater behavior, evaluated well performance, and assessed aquifer contamination hazards. Up-gradient threats from septic contamination and limitations in available water rights were specifically identified.

Anaconda recently retained HKM Engineering to conduct further feasibility analysis and preliminary design for central wastewater collection in the West Valley area. Implementation of such service remains in question because of cost, but would remedy further risks of septic contamination to Anaconda's western aquifer.

The NRDP funded the *Opportunity Groundwater Injury Assessment* for ADLC in 2001. This project included groundwater testing in the Opportunity area, approximately 4 miles east of Anaconda. The results of this study indicated an "island" of uncontaminated groundwater in that area. This resource, however, is not a viable option for expanding Anaconda's water supply for several reasons:

- Opportunity has been studied as a candidate for central water supply of its own (*Draft Opportunity Water & Sewer Feasibility Study*, Robert Peccia & Associates, January 2000), and groundwater resources there may be needed locally.
- The feasibility study concluded that 14,000 feet of 12-inch transmission main would be needed to connect to Anaconda at an estimated (year 2000) cost of \$1.3 million.
- MDEQ *Source Water Protection Delineation* requirements for new municipal wells per *Circular PWS6* may be difficult to meet in the Opportunity area, given the contaminated

aquifer zones in proximity.

ADLC holds 7.63 cfs (3,425 gpm) of surface water rights for the Hearst Lake/Fifer Gulch supply southwest of the community, which it currently cannot use. Although a high quality surface water supply, Anaconda is unable to use these sources for two reasons – conveyance facilities are badly dilapidated, and no treatment or disinfection is provided. Robert Peccia & Associates conducted a comprehensive engineering evaluation of the system in December 1996, entitled the *Hearst Lake/Fifer Gulch Water System Preliminary Engineering Report*. That report concluded that the reliable hydrogeologic yield from these sources is less than half of the water right, and turn-of-the-century *Kalimane* transmission piping is estimated to lose half of the remaining yield (*pers. comm.* Bob Morton, Robert Peccia & Associates, 12May04).

ADLC's 2004 PER further evaluated this source, and concluded it is not the most feasible nor cost-effective alternative available to the community (see PER pp. 65 to 72 reproduced in **Appendix C**). The PER estimated \$3.1 million in combined costs to upgrade the system (see PER p. 66 reproduced in **Appendix C**). This cost estimate assumed disinfection only and no filtration of the surface water supply. Under EPA's pending *Long Term 2 Enhanced Surface Water Treatment Rule*, 24 months of testing for *Cryptosporidium* and *Giardia* will be conducted before determining the extent of treatment for all surface sources. If filtration proves necessary, costs would increase substantially.

Hence surface water supply from the Hearst Lake/Fifer Gulch is not a readily available nor cost-effective option for Anaconda. Development of new municipal wells is also problematic, and the community remains stymied in practical options to expand its water supply.

A.3. Ongoing and Past Efforts

The City-County has made significant progress in upgrading its water system, due in no small part to recent funding assistance from the UCFRB Restoration Fund. But substantial needs yet remain.

ADLC installed a new well field and a 3.5 million gallon storage tank in 1994-95, at a cost of \$3.6 million. A "peak demand" (untreated) connection to the Silver Lake Pipeline was eliminated due to regulatory non-compliance. At the same time the utility expended over \$2.5 million to replace approximately 34,500 feet of high-leakage mains along the Commercial and Park Avenue corridors and elsewhere in its distribution grid. The City-County also funded the Warm Springs Campus main extension, preparation of the 2003 wellhead protection study, and the 2004 PER.

From 2002 through 2005, ADLC has received annual grant awards from the NRD Program, allowing construction of critical transmission main replacements on Main Street and East and West Fourth Streets. Construction of the West Fourth Street transmission main in 2005 completed upgrade of the primary conduit in the system for water delivery to the central Anaconda service area. The 2005 grant award will be used to reconstruct distribution mains on Seventh, East Sixth and East Eighth Streets during the 2006 and 2007 construction seasons. Including its local cash match on these four grants, **ADLC will have invested almost \$9 million in its water system since assuming operations in 1992.** Collectively over the last two decades, ADLC has replaced over 75,000 feet of old leaking mains.

The current proposal for 2006 UCFRB funding proposes replacement of the East Third Street and South Birch distribution mains, plus a booster pump station for the latter (see **Figure 3**, previous). The East Third main is in critical condition, while the South Birch line is undersized and unable to sustain adequate water pressure for users there. The ADLC Water Department has repaired 15 leaks along East Third in the last two decades, 11 of which were in the 300 and 400 blocks (see **Figure 3**). Replacement of these 100-plus year old mains will reduce water lost to leakage and preserve ADLC's limited water resources. Upgrading six-inch main segments on East Third Street to eight-inch, and replacing four-inch line on South Birch with six-inch pipe will also enhance water service and fire protection. The proposed booster station will assure that water service is maintained to South Birch residents.

Improvements to date have resulted in substantial water rate increases for Anaconda users. In 1992, Anaconda's average monthly water rate was \$11.59 per user. By Resolution No. 268 (March 2, 1993), Anaconda-Deer Lodge County enacted the equivalent of a 74 percent rate hike, increasing the residential monthly "flat" rate to \$18.58, plus a sprinkling charge based on property footage. For the 3,228 Equivalent Dwelling Units (EDU's) served by the water system, the FY03-04 rate revenue of \$877,003 translates to an average of \$22.64 per month per EDU (PER, p. 43).

The 2004 PER recommended a \$5.00 per month rate increase (PER, p. 83). Following public hearings in 2005, the Council of Commissioners by Resolution No. 05-27 (see **Appendix A**) enacted an three-year phased water rate increase beginning January 1, 2006. Effective that date, flat rates increased 12 percent (new residential flat rate of \$20.80 per month). January 1st of 2007 and 2008, additional increases of 12 percent and 11 percent, respectively, will occur. This will bring the (single family) residential flat rate to \$25.86 by 2008. Seasonal sprinkling rates are being increased by similar percentages. Based on past years' revenues, revised sprinkling charges will add the equivalent of \$5.65 per month per EDU, **bringing the projected residential rate to \$31.51 per month by 2008**. This represents a 172 percent increase in water rates since 1992!

Two benchmarks lends context to ADLC's water rates. The *Survey of Water, Wastewater, and Solid Waste Facility Rates in Montana* (Morrison-Maierle, Inc., July 2, 2003) compares utility rates by community on a statewide basis. This study reports that amongst other larger cities in Montana in 2003, Billings, Great Falls, and Kalispell all had water rates lower than ADLC's \$22.64 monthly average at the time. The Montana Department of Commerce formula for Affordable Target Rate for water systems only is 1.4 percent of Median Household Income, times a 94 percent affordability index for 2008. Based on ADLC's Median Household Income of \$26,305 (*Census 2000*), this translates to an **MDOC Affordable Target Rate for municipal water of \$29.92 per month in 2008**. Anaconda's water rates will exceed this threshold at the end of the three years of increases currently underway. *[It should be noted that the MDOC Affordable Target Rate applies to both water and sewer systems, which for 2008 will be 94 percent of 2.3 percent of Median Household Income, or a \$47.39 per month combined rate. At ADLC's current wastewater rate of \$5.25 per EDU, its combined rates are projected at \$36.76 in 2008, below Affordable Target Rate.]*

While Anaconda's water rates are keeping pace with statewide norms, it finds itself in a serious cash deficient position following completion of an audit in February 2006. Only approximately \$125,000 is currently available for capitalization in the Water Enterprise Fund, all of which is already committed towards the \$225,000 cash match needed for the 2005 NRD grant on the Seventh, East Sixth and East Eighth water project. This cash shortfall was not known at the

time of the 2005 NRD grant application, and prompted rescheduling of that project from one to two construction seasons to allow additional accumulation of rate revenues.

This situation results from recent audit findings showing deficiencies in bond reserves and excess coverage required on the municipal issue(s) for the 1994-95 system improvements (audit report by Newland and Company, P.C., will be published by March 31, 2006, and thereafter made available to the NRD Program upon request). This leaves ADLC in the unfortunate position in 2006 of having no cash to contribute as local match for this grant proposal. To correct such shortfalls in ensuing years, beginning in March 2006 the City-County is setting aside \$10,000 monthly from water rate revenues to provide \$120,000 annually towards cash match on NRD grant proposals in 2007 and thereafter.

The schedule for future water main replacements, while critically needed, is limited by ADLC's financial capacity. The drastic additional user rate increases necessary to fund major main replacements without NRD grant assistance would be an undue burden for Anaconda's water users.

B. Description of Project Goals and Objectives

The primary goal of this project is a significant reduction in the two-plus million gallons per day of estimated water lost to leakage in Anaconda's piping system. A related objective is to extend the existing water supply in the most cost-effective manner possible as established in the 2004 PER, i.e., by replacing old mains to eliminate leakage.

In its 2004 PER, ADLC has prioritized mains for future replacement based on age, leak history, and critical function in the overall distribution system, leveraging funding opportunities as they arise. This approach assures that the least serviceable, most critical mains are addressed first. As described previously in Part A (see page 9), the City-County has amended those priorities slightly by Commission Resolution No. 06-07 (see **Appendix A**) to allow time for a public education program prior to implementing system-wide metering, and also address a localized pressure problem that has intermittently deprived South Birch water users of service. These changes remain consistent with **ADLC's overall water infrastructure goals and objectives – specifically to conserve and extend its existing water supply by correcting excessive water main leakage.** This objective was also identified in the 2004 PER as the most cost-effective alternative for the community (see PER p. 72 reproduced in **Appendix C**).

Existing mains along the East Third Street and South Birch project corridors are 100-year-old *Kalimane* pipe in deteriorated condition, with known leakage. Prevalent leak repairs by the ADLC Water Department along East Third are plotted in **Figure 3** (previous). The 208 residential and commercial users along the East Third and South Birch corridors are each served by taps on the existing mains. Service taps in some cases date as far back as the mains, and all service taps will be replaced along with eight fire hydrants.

Existing leakage along these old mains will be eliminated by this project. A 1992 leak detection survey (Utility Services Associates and Robert Peccia & Associates) found one major leak along East Third at Jefferson Street that was estimated at 20 gpm (see **Figure 3**, previous). That leak alone represents an annual water loss of over 10 million gallons. **A 2004 analysis in the PER quantified 2,183,000 gpd of leakage in Anaconda's water system, or 76 percent of total baseline (winter) water production!** Based on comparison of 2002 water delivery, wastewater generation, and storage volumes, this analysis concluded that the bulk of this

leakage stemmed from 72,910 feet of old pipe in the system identified for replacement in the PER (plus 10,459 feet replaced on Main Street and East Fourth between 2002 and 2004 preceding the PER). This translates to a **system-wide average of 26.2 gal/day of leakage per lineal foot of old pipe in the system** ($2,183,000 \text{ gpd} \div 83,369 \text{ ft}$). Even allowing for the 26,994 feet of mains replaced with NRD funding since 2002 (including 2006 construction of Schedule I of Seventh, East Sixth and East Eighth project), approximately 1.5 mgd of leakage theoretically remains from old mains.

Using this index, **the 5,670 feet of main replacement proposed on East Third and South Birch Streets could save Anaconda another 148,500 gallons of water per day, or 54 million gallons per year!** This represents a crucial contribution to remedying the excessive water lost to leakage in Anaconda's system, and a commensurate savings of its existing water supply. In conjunction with similar projected water saving from the Main Street, Fourth Street, and Seventh, East Sixth and East Eighth improvements, the cumulative leakage reduction that has occurred will be quantified at the completion of this project. **A program for quantifying the leakage remaining in the wake of these projects is described in Part F - Monitoring Plan.**

The East Third Street and South Birch project proposal conforms with ADLC's water infrastructure and capital improvements goals by:

- Achieving continued reductions in water lost to leakage, thereby preserving finite water resources;
- Extending and maximizing the utility of its well field to avoid premature water supply expansion; and
- Addressing main replacements in conformance with the priorities established in the 2004 PER by replacing deteriorated mains according to their most critical condition and service.

B.1. Current Conditions

B.1.1. Current Resource Conditions

Water resources in the Anaconda area are seriously limited by past natural resource damage and groundwater contamination, areas of which extend within one mile of the municipal well field. A Superfund site encompasses many otherwise lucrative groundwater resources (*Anaconda Groundwater Injury Assessment Report*, Dr. William Woessner, January 1995). The by-product of 100 years of smelting operations in the Anaconda area created several hundred million cubic yards of mining-related tailings, and many acre feet of contaminated groundwater that will never be remediated. With Smelter Hill to the East, the Opportunity Ponds to the North, Silver Bow Creek to the East, and the South Opportunity/Yellow Ditch and Blue Lagoon to the South, Anaconda lives with heavy metals contamination in the soils and groundwater.

The vast aquifer underlying the East Valley is contaminated (**Figure 1**, previous). Bedrock groundwater contamination has also been found more recently to extend onto Stuckey Ridge and into the Anaconda (South) Uplands. In addition, outlying residences west of the community rely on individual septic systems, which may be resulting in localized elevation of nitrates, phosphorous, and bacteria in that shallow aquifer. Such an impairment in the West

Valley area could be particularly critical to Anaconda's municipal well field, and limit expansion prospects irrespective of water rights.

As explained in the preceding section, 1.5 mgd of leakage theoretically remains in Anaconda's distribution system, accounting for mains replaced since the PER leakage analysis using 2002 data. Obviously, this still a substantial waste of water resources, particularly given seasonally strained supply during summer irrigation periods. **Even at 1.5 mgd of remaining leakage, only one out of three gallons pumped from wells during the winter actually reach consumers!** (Based on 3.0 mgd winter supply pumping during leakage study; see PER p. 23). Peak summer demands are sometimes not met. Water supply expansion will eventually be necessary, but is both premature and a financial hardship without first eliminating excessive leakage losses. This same conclusion was also reached in the 2004 PER (see p. 71 reproduced in **Appendix C**).

Many other Montana communities likewise seek to expand their public water supplies. The difference in Anaconda is that **groundwater contamination from past smelting activities has a direct impact on the cost, location, availability, and sustainability of any expansion to its municipal water supply**. Anaconda relies on clean groundwater for its supply, and no water treatment other than chlorination is necessary for its existing well field.

With this point of reference, the current condition whereby up to 148,500 gpd may be lost to leakage from the East Third and South Birch Street water mains is untenable. Leakage elimination by replacement with new piping is absolutely necessary.

B.1.2. Uncertainties Regarding the Current Condition

Uncertainties relative to current conditions have minimal influence on the need for or execution of the project. The "technically infeasible to remediate" status of metals-contaminated aquifers adjacent Anaconda is well established (*Anaconda Groundwater Injury Assessment Report*, January 1995). While some conclusions therein are established by predictive modeling, the extent and concentrations of contamination are great enough to render the contaminated aquifers unquestionably unfit for municipal water supply (see **Appendix D**).

Relative to the leakage from Anaconda's water system quantified in the 2004 PER, some uncertainty exists as to the locations where this is occurring. While it is undoubtedly associated with old mains in the system, the leakage is unlikely distributed uniformly across all old lines. This does not compromise the need for the East Third Street and South Birch project. A serious history of leaks is documented along East Third (see **Figure 3**, previous), and chronic low pressure problems and intermittent loss of water service is a known problem for South Birch water users.

B.1.3. Map of the Project Area

(See **Figure 3** on page 12.)

B.2. Underlying Causes of Current Condition

B.2.1 Identified and Potential Causes of the Problem

Contamination of groundwater in and around Anaconda is well documented in the *Anaconda Groundwater Injury Assessment Report* (January 1995). Contaminants are comprised of dissolved metals with concentrations above the EPA Primary Maximum Contaminant Level (MCL) for arsenic and cadmium, and EPA Secondary MCL's for iron, manganese, sulfate, and zinc (see **Appendix D**).

Where the shallow aquifers are not already contaminated, the presence and proximity of these contaminants exacerbates the likelihood that additional aquifer withdrawals will result in migration of contaminants, polluting the remaining limited uncontaminated aquifer zones. Consequently, new well development options are limited by a number of factors, including:

- Past mining and smelting activity has rendered a significant portion of available groundwater resources unusable;
- Staunch competition (and prior water rights commitments) for groundwater resources suitable for potable water supply;
- Well drilling prohibitions by covenant in many areas adjacent to Anaconda due to aquifer contamination; and
- Extensive residential development outside Anaconda exists without the benefit of central wastewater collection, posing potential septic system hazards to new well installations in those locales.

Surface water resources in the area have likewise been impaired in some cases, and lost in others. Prior to 1992, Anaconda relied on an (untreated) connection to the Silver Lake Pipeline for peaking supply. While filtration treatment would have been necessary to retain this supply under the *Surface Water Treatment Rule* of the *Safe Drinking Water Act*, it has since been diverted to Butte for industrial use and in-stream flow remediation in Silver Bow Creek. Surface water supply development is comparatively less desirable for Anaconda given substantially higher costs associated with filtration treatment requirements imposed by the federal *Surface Water Treatment Rule*. The cost and effort to comply with these regulations are likely to increase significantly with the forthcoming promulgation of the *Long Term 2 Enhanced Surface Water Treatment Rule*.

All of this underscores the extremely crucial need for Anaconda to protect and preserve its existing groundwater resources. ADLC's ongoing commitment to minimizing water distribution system leakage is key to promoting this goal.

Limited financial capability on the part of the City-County is another underlying cause of the current condition. Having inherited a poorly maintained, substandard public water system a decade ago, ADLC has experienced overwhelming needs for reconstruction and associated capital expenditures. With close to \$9 million of new water improvements funded by its water users since 1994, ADLC has done an admirable job with very limited financial resources. **Financial augmentation from the UCFRB Restoration Fund has been a tremendous recent asset.** Now however, further momentum is dependent on continued outside financial assistance. With bond retirement from the past distribution, well, and storage upgrades six years away, and a high existing mil levy (750 mils), ADLC does not currently have the financial capacity to replace the East Third and South Birch water mains by itself.

B.2.2. Limiting Factors

Both the extent of groundwater contamination (**Appendix D**) and the magnitude of leakage losses from Anaconda's water system (PER, p. 23) have been quantified. As described in Part B.1.2, both factors rely somewhat on predictive estimates. However even if either factor is understated, their causative role in the current conditions, and the severity of their impacts to Anaconda's water supply options are irrefutable.

B.3. Desired Future Condition

B.3.1 Project Goals and Objectives

Construction of the proposed East Third Street and South Birch water main replacements represents a critical step in conserving ADLC's limited water resources, and providing reliable water service to its consumers. The desired future condition(s) and goals and objectives resulting from the project include:

- Reducing wasted water lost to main leakage by as much as 148,500 gpd, and prolonging the utility of existing water supplies; and
- Promoting reliable water service for residents and businesses fronting along the project corridors, for both domestic water and fire protection service.

B.3.2 Desired Changes in the Current Condition

Replacement of these distribution mains will enhance water service and availability, and provides an important **replacement project** for water resources lost by the community due to mining and smelting contamination. The proposed project will not entirely eliminate water loss due to leakage in the existing Anaconda water distribution system, but represents a significant step towards that goal. **Making up to an additional 54 million gallons of water annually available for use by consumers is an important offset (replacement) for natural resources that have been irreparably lost to the Anaconda community.**

Additionally the proposed improvements along East Third Street will restore a continuous water main connection beneath the Rarus railroad at Madison Street. The previously abandoned pipe segment beneath the tracks now results in a "dead end" main in the 1200 block of East Third Street, fed from the main on Monroe Street. Eliminating this dead end improves flow delivery and avoids potential water stagnation and resultant water quality impairments.

The project goals and objectives and improvements to current conditions are proposed to be verified by a post-project reevaluation of system-wide leakage in the Anaconda water system, as detailed in Part F - Monitoring Plan.

B.3.3. Contributing Factors Not Addressed by the Proposed Project

As a “replacement” rather than “restoration” project, the East Third Street and South Birch water main improvements will not alter the current status of groundwater contamination in the Anaconda area. No direct remediation activities relative to aquifer contamination are included in the proposed project.

B.3.4. Primary and Secondary Benefits of the Project

With an estimated production/delivery cost of \$1.07 per thousand gallons (based on an annual water utility budget of \$1.37 million), correction of even 20 gallons per minute of leakage represents \$11,250 in annual primary benefits from upgrading the East Third Street and South Birch distribution mains. As described previously, likely leakage could realistically may be as much as 54 million gallons annually, translating into \$57,800 in annual benefits due to saved water.

This annual savings is commensurate with the annual equivalent cost of the \$2 million project (\$82,800 at 4.0 percent interest and 100-year project life), without quantifying the significant secondary economic and environmental benefits.

Secondary benefits include reduced utility and roadway maintenance, and the infusion of approximately \$650,000 in one-time economic stimulus resulting from water main construction labor. The project will also strengthen the City-County government’s ability able to meet the infrastructure needs of a developable community.

C. Project Implementation Plan and Task Chronology

C.1. Approach to Project Implementation

Project implementation requires engineering design and construction of the proposed improvements. Along the project corridors, major construction work characteristic of underground utility construction will be required. Professional services for engineering design and construction inspection will be retained, and Contractor services for construction will be selected through a competitive bid process. Both engineering and construction activities will be of the type traditionally required for municipal utility projects.

C.2. Project Phases and Tasks

Implementation of the proposed project will proceed according to this chronology, with the phases and tasks noted.

1. As part of its local match, ADLC has already conducted preliminary engineering for the project, retaining Morrison-Maierle, Inc. for conceptual design, including preparation of **Figures 4A** through **4F** (appearing at the end of this section) and the project construction cost estimate in **Table F-3** (see **Appendix F**).
2. ADLC will retain an Engineering Consultant for design and construction inspection through a competitive, quality-based-selection process as prescribed by state law.

Engineering services are anticipated to be contracted in December 2006. Hiring of the Consultant will allow completion of surveying and design in anticipation of bidding the work for construction in Spring 2007.

3. Following a detailed survey of the project corridor, a geotechnical investigation and soils borings, and any hazardous materials testing that may be required, design plans and specifications will be prepared by the Engineering Consultant as a basis for bidding and construction.
4. Prior to advertisement of the project for construction bidding, final plans and specifications for the water main replacement will be furnished to ADLC and the MDEQ for review. Any agency-required modifications to the documents will be incorporated prior to bidding. Final plans will also be furnished to the NRD Program to verify conformance of the design with the project proposal contained in this application.
5. Following a publicly advertised bid solicitation in accordance with state law, a Contractor will be selected and contracted for the construction work. Construction is anticipated to span approximately six months, with completion in calendar year 2007. During construction, inspection and contract administration services will be provided conjunctively by the Engineer. Contractor bonds will guarantee performance.
6. Construction will be preceded by a Preconstruction Conference, review of submittals and shop drawings, field location of existing utilities, materials testing, and approval of the construction Contractor's proposed construction schedule.
7. East Third Street and South Birch water main construction will be authorized by a Notice to Proceed issued by ADLC.
8. Field inspection and construction contract administration for East Third Street and South Birch water main replacements will be primarily the responsibility of the Engineering Consultant, with collaboration by the City-County Planning Office, and personnel from ADLC's Water, Streets and Roads, and Fire Departments.
9. Following completion of construction, the new water mains and South Birch booster station will be commissioned and tested.
10. Upon receipt of the Contractor's lien releases and contract close-out documentation, and with the concurrence of the Engineer, ADLC will accept the completed East Third Street and South Birch water main project, and issue final payment to the Contractor.
11. Project close-out tasks following construction will include preparation of "as-built" drawings by the Engineer, and ADLC's submission of close-out reports to the NRD Program. The Engineer will issue the legally required Certification of Completion in Accordance with Approved Plans and Specifications to the MDEQ, following construction.
12. A one-year construction warranty will be provided by the construction Contractor, with the backing of his/her performance bond, to assure repair of any defects in workmanship or materials occurring after construction.

13. During the winter of 2006-07, following completion of construction, ADLC proposes as part of this project to conduct a quantitative reevaluation of overall leakage from its water system to assess the improvements from five years of major main replacements. This task is described in detail in Part F - Monitoring Plan.

In conjunction with task 8, above, the City-County will also undertake several significant tasks to support the construction and provide thorough restoration of the project corridors and related infrastructure therein. The costs for labor and materials incurred by ADLC for these tasks is being claimed as part of local in-kind match to UCFRB Restoration Funds, as described under Criteria Statement 14. Specific construction-related tasks to be provided by the City-County include:

- Historic Street Lighting along East Third Street is maintained by ADLC, and will be disrupted by the water main construction. Historic light poles located in street boulevards will require removal and resetting where existing water service connections pass near or beneath their bases. Existing concrete bases will require replacement, and pole mounting brackets will need modifications to mount to new precast bases. Additionally water main trenching will disrupt existing light wiring, currently buried beneath paving adjacent the north curb line of East Third. ADLC will replace old wiring with new PVC conduit and conductor, installed in the upper portion of the Contractor's water main trench prior to backfilling. (See **Table F-1** in **Appendix F**.)
- An old streetcar rail bed underlies the center of Third Street between Willow and Madison Streets (see Cover Photos 1 and 3), and creosote-treated ties and concrete bases remain. Where water line excavations cross this route, old ties are anticipated to require disposal as hazardous materials, along with adjacent soils showing any creosote contamination. With the water main located in the north driving lane of East Third, only water services and connecting mains to the south will cross the streetcar rail bed. For contaminated materials excavated from these crossings, ADLC will provide the Contractor with access to the ARCO Repository for disposal. ADLC will likewise furnish the Contractor with clean replacement fill for these areas. Hauling and placement of these materials will be part of the construction contract. (See **Table F-2** in **Appendix F**.)
- Lawn topsoil at some residences along East Third Street has been replaced by ARCO under the Community Soils program. Since water service connections will be relaid across boulevard areas (to the curb stop at the property line), new topsoil will be needed at each of these residences. Anaconda will provide the Contractor access to ARCO topsoil stockpiles for this replacement material. Hauling and placement will be the responsibility of the Contractor. (See **Table F-2** in **Appendix F**.)

For these in-kind services, costs are described in Step 6 - Proposal Budget and **Appendix F**. Additional ADLC staff time associated with these tasks and project oversight are described in Part C.3, following.

C.3. Project Staff

Execution of the proposed project will involve staffing by both ADLC and its Engineering Consultant. Within the City-County the following staffing levels are anticipated for the water main replacement project East Third and South Birch. Time commitments are based on experience with prior NRD-funded water main projects. A **six-month construction period is anticipated**, with additional staff time for liaison during completion of design, bidding, and project close-out. Twelve months of total project activity are expected (mid-December 2006 through mid-December 2007 - see Part D following), followed by the post-project Monitoring Plan described in Part F. Staff facilitation for the project will involve the departments and personnel listed below. (See also **Table 6-1** in Step 6 - Proposal Budget.)

ADLC Planning Department	Planning Director	Project oversight and fiscal management from pre-construction, through to post-construction (4 hrs/mo for 12 mo.)
ADLC Planning Department	Clerical Staff	Project support services (2 hrs/mo for 12 mo.)
ADLC City-County Attorney	Attorney	Legal oversight for construction contracts and associated legal issues (4 hrs/mo for 2 mo.)
ADLC Chief Executive's Office	Chief Executive	Project oversight, reports to Commission and public relations (1 hrs/mo for 6 mo.)
ADLC Water Department	Water Supt.	Records retrieval for design, plan reviews and periodic field inspection (4 hrs/mo for 6 mo.; 16 hrs/mo for 6 mo.)
	System Operator	Assist construction Contractor with valve operation and system isolation (48 hr/mo for 6 mo.)
Streets & Roads Department	Roads Supt.	Traffic routing, and pavement inspection during construction (32 hrs/mo for 5 mo.)
	Roads Laborer	Sanitary and storm sewer locates during construction; pavement inspection (40 hrs/mo for 5 mo.)
ADLC Fire Department	Fire Chief	Fire hydrant temporary closures and emergency vehicle access routing during construction (1 hrs/mo for 7 mo.)

Street Lighting District	Superintendent	Field locates, repairs as required, pole removal and replacement, and new conduit and wiring required for Historic Street Lighting (20 hrs/mo for 4 mo.)
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Additionally materials provided by ADLC and/or ARCO for construction are itemized in Criteria Statement 14 and **Appendix F**.

C.4. Contracted Services

Contracted services will be required for the proposed project to out-source engineering and construction. Anticipated contracted services for engineering and construction are as follows:

Engineering Consultant(s)	<p>Already completed preliminary engineering for conceptual design drawings (Figures 4A through 4F at the end of this section) and construction cost estimate (Table F-3 in Appendix F); proposed as part of ADLC local match.</p> <p>Preparation of East Third Street and South Birch water main replacement and South Birch booster station design plans and specifications.</p> <p>Assistance with solicitation of agency approval of bid documents, bid advertisement, opening, and construction contract award.</p> <p>Construction field inspection.</p> <p>Construction contract administration, shop drawing review, pay estimate review, as-built drawings, construction contract close-out, and certification of completion to MDEQ.</p> <p>Performing post-project reevaluation of system-wide water leakage as described under Part F - Monitoring Plan.</p>
Construction Contractor	Construction of East Third Street and South Birch water main improvements and booster station.

Engineering Consultant services will be procured by ADLC through a professional services procurement process. The construction Contractor for the improvements will be selected

through duly advertised public bidding. Relative to procurement of its Engineer and competitive bid selection of the construction Contractor, ADLC will submit “Attachment E - Procurement Documentation” to the NRD Program.

C.5. Permits and Regulatory Approvals

Permitting and access requirements for the proposed project are anticipated to be minimal. The East Third Street and South Birch water mains will be re-laid near their current alignment, within dedicated street and utility right-of-ways, so that no additional easements will be required.

Directly east of the intersection of East Third and Madison Streets, the replaced water main will cross railroad tracks owned by the Rarus Railway Company see **Photos 3 and 4**, following page). This “bored and cased” underground crossing will require a permit from the railway company. No US or State Highway crossings will be entailed along the corridors, and permitting in these venues will not be required for the project. Likewise no stream crossings or associated permits will be required. Work will be confined to previously excavated utility corridors, currently occupied by the existing water mains.

Prescriptive state licensing and county tax filings will be required of the construction Contractor. A storm water management permit will also likely be required of the Contractor, as described in Step 4 - Environmental Impact Checklist and Narrative.

Regulatory approval will be needed from MDEQ for the design plans and specifications for the East Third Street and South Birch water main replacements. Because the mains are part of a municipal water distribution system, MDEQ maintains plan approval jurisdiction to assure that new facilities conform to the standards of *Circular DEQ-1*. For main replacements, a “Certified Checklist” can be used for plan submission, avoiding full plan review fees. Following construction completion, the Engineer will also have to file a “Certification of Completion in Accordance with Approved Plans and Specifications” with the MDEQ, as required in that agency’s approval process.

C.6. Project as a Phase of a Larger Project

The East Third Street and South Birch water main replacements are a “stand alone” project for which UCFRB Restoration Funds are requested. The project will be executed as a singular project.

As discussed in Part A, the City-County adopted a PER in 2004 outlining sequential water system upgrades through the year 2013 (see PER Table 7-1 reproduced in **Appendix B**). The water improvements prioritized therein serve as ADLC’s template for ongoing, individual annual projects.

(Insert Photo 3 & 4 page, showing Rarus RR crossing)

C.7. Assurance of Long-term Cost Effectiveness

Cost effectiveness of the proposed project in the long term is being promoted in several ways:

- The design of the project will emphasize cost-effectiveness in construction requirements, and be subject to the Engineer's internal quality assurance/quality control program. A nominal design life of 20 years for mechanical equipment in the new South Birch booster station and a new water main useful life of up to 100 years promote long-term cost efficiency of the project.
- Competitive bidding to select the construction Contractor maximizes competition and minimizes construction costs.
- This project being part of a well-founded, long-term water utility improvements plan (i.e., the 2004 PER) promotes long-term cost effectiveness. The proposed improvements are a component of ADLC's long range plan that identified and prioritized the most critical water infrastructure needs, and addresses them sequentially.

D. Project Time Schedule

The following time-line is proposed for the East Third Street and South Birch water main replacement project:

ADLC engineering services competitive selection and contract award	Nov. 6 - Dec. 15, 2006
UCFRB Funds award and initiate NRDP-ADLC contract preparation	Dec. 15, 2006
Engineer's field survey and Phase I environmental assessment	Dec. 15, 2006 - Feb. 9, 2007
Engineer's preparation of design plans and specifications	Feb. 12 - Mar. 16, 2007
MDEQ approval of water main plans and specifications	Mar. 30, 2007
Secure Rarus Railway Company crossing permit	Mar. 30, 2007
Construction bid advertisement	Apr. 1 - 20, 2007
Construction bid opening	Apr. 20, 2007
Construction contract award and mobilization	Apr. 23 - May 18, 2007
Construction	May 21 - Nov. 16, 2007
Final completion of construction	Nov. 16, 2007
System commissioning and project close-out	Nov. 19 - Dec. 17, 2007
Post-project water leakage study (Monitoring Plan)	Feb. 18 - Mar. 31, 2008

Full project completion (including water leakage study)

Apr. 1, 2008

One-year construction warranty inspection

Nov. 14, 2008

E. Project Methods and Technical Feasibility

E.1. Description of Project Methods

Conventional methods for underground utility design and construction will be used on the project.

A state-licensed Professional Engineer will be in “responsible charge” of preparation of design and bid documents, as required by state law. These professional services will be retained by ADLC through an established engineering consulting firm experienced in the conduct of similar underground utility projects. The Engineering Consultant will also be retained to provide quality control inspection during construction, and assist ADLC with contract administration and close-out.

The construction Contractor will be selected to build the project through a publicly advertised, competitive bid process. Following bid advertisement, opening, and evaluation, award will be made by ADLC. A formal contract will be entered into between ADLC and the construction Contractor, backed by Performance and Payment Bonds, each in the amount of 100 percent of the contract.

The construction Contractor thus employed will use conventional construction methods for installation of the waterlines, including open trench excavation in accordance with *Occupational Health and Safety Administration (OSHA)* norms, and pipeline assembly and testing per MDEQ and *American Water Works Association* standards for design, materials, and construction. New mains will be six- and eight-inch pressure class 350 ductile iron, subject to final project design.

Given the replacement nature of the East Third Street and South Birch water main construction, the Contractor will be required to maintain water service to ADLC customers during construction. As has been done for past main replacements in Anaconda, this will entail selective isolation of portions of the water mains, with provisions for temporary service to individual users. Individual service connections are distributed along the entirety of the project corridors on both sides of the streets. The usual approach employs an above-ground, portable header pipe with temporary hose connections to “back feed” individual buildings through hose bibs. Disinfection of portable service equipment assures sanitary quality. All existing service connections between the corporation stop on the main and the user’s curb stop will be replaced.

Isolation of localized portions of the East Third Street and South Birch mains to facilitate re-construction will also require coordination to assure uninterrupted supply to other portions of the water distribution system. Existing intersecting water mains will be re-connected to the new mains, and new valving will be provided. Existing “cross” mains will be replaced to the curb line on paved streets along the corridors. This will assure that all piping beneath the paved portions of the corridors is adequately upgraded.

Equally important will be maintenance of fire protection, and coordination with the ADLC Fire Department to assure that hydrants remain serviceable, or if not, that their temporarily inoperable status is known to fire fighters. Simultaneous involvement of the ADLC Streets and Roads Department will also assure that residential, business, and emergency vehicle access is suitably maintained throughout construction.

E.2. Past Use of Similar Project Methods

These same methods were successfully used by ADLC on over 54,000 feet of recent water main construction, including the 2003 Main Street replacement, the 2004 East Fourth Street transmission main, the 2005 West Fourth Street transmission main (see **Appendix E** bid tab), and other mains constructed since the mid-1990's. The identical approach is also underway for management of the NRD-funded Seventh, East Sixth and East Eighth Street main replacement project, Schedule I of which is advertised to bid on March 17, 2006, and is slated for construction next summer.

ADLC's Water Department will facilitate maintenance of water service, and provide additional oversight during construction to assure conformance of the completed project with the utility's existing water infrastructure. The ADLC Streets and Roads Department will also provide supplemental oversight during construction to assure access is maintained and that replaced pavement meets City-County standards. The Streets and Roads Department is also responsible of operation and maintenance of the sanitary and storm sewers in Anaconda, and will provide locating services where new water mains come in proximity to sewer facilities.

E.3. Innovative Approaches

No innovative approaches are anticipated on the proposed project. Design and construction techniques will involve proven, regularly used methodologies, conforming to the *Montana Public Works Standards Specifications for Construction*. Equipment and materials used will be typical of trench earthwork and underground utility construction.

E.4. Project Uncertainties

Project uncertainties are minimal. Replacement pipeline routes are precisely identified, and are already used for like purpose. Soil conditions for trench earthwork will be substantiated by test borings and soil testing during design, including hazardous materials testing if/as warranted. The locations of other existing utilities that may pose spatial conflicts with new water pipelines will be field surveyed, and will be re-verified at the start of construction using the central *One-Call Locating Service*.

In this fashion, any vertical or horizontal pipeline adjustments necessary to provide adequate clearance with existing utilities will be addressed in design. *Circular DEQ-1* standards require 18 inches of vertical and 10 feet of horizontal separation between water and sanitary or storm sewer mains. (Water service lines are exempt from these requirements.) Sanitary sewers are absent in the street corridors of the project, although a storm sewer courses along the south driving lane of East Third Street. In the event inadequate separation exists at any storm sewer

crossings of the existing water main alignments, the replacement pipelines will be rerouted during design as necessary to achieve the required clearances.

The presence of creosote-impregnated streetcar rail bed ties along East Third Street between Main and Madison Streets raises the likelihood of hazardous materials handling. ADLC took some initial “grab samples” of soil from test excavations along the route of the old streetcar track and submitted them for arsenic testing, which was not found present above RCRA limits. However creosote materials will likely require RCRA-compliant handling and disposal, and further testing will be conducted during design. A Phase I environmental assessment will also be conducted along the full extent of both project corridors.

As part of its local match, ADLC will make arrangements for disposal of any hazardous materials from the excavations at ARCO’s Repository, and the City-County will provide clean replacement fill. This is anticipated to involve excavated creosote-treated ties and adjacent soil at a minimum.

In the event unanticipated other hazardous materials or contaminated soils are encountered, consultation with the USEPA, ARCO, MDEQ, and the NRD Program will occur as necessary to assure environmentally compliant disposition of such materials.

E.5. Data Gaps

Additional data collected during engineering design will address any data gaps for the project. The additional data to be collected include the following:

- Locational field surveys for new water main installation and any conflicts with existing utilities, allowing this information to be incorporated and addressed in the final engineering design.
- Geotechnical investigation including soils borings along the project corridors, providing a basis for excavation, backfill, pipe bedding and soil compaction requirements to be included in the design specifications.
- Additional hazardous materials testing of soil samples where contamination is suspected or evidenced, along with a Phase I environmental assessment along the corridors. These data will allow formulating appropriate requirements to include in the design specifications for safe and environmentally secure handling and disposal of such materials.

E.6. Potential Complications

No potential complications on the project are anticipated. Proven project methods will be used by adequately qualified project team members, maximizing the prospects for a successful project outcome.

Despite a thorough construction cost estimate prepared on the basis of thorough preliminary design plans (see **Figures 4A through 4F**, appearing at the end of Step 3), construction market costs have seen unprecedented inflation over the past two years. Radical increases in fuel,

concrete, steel, and pipe material prices have contributed to this trend. Hence the possibility exists that the “low” construction bid received on the project in April 2007 could exceed the current cost estimate, particularly given the intervening 14 months. The construction cost estimate supporting this application (see **Table 6-2** in Step 6 - Proposal Budget) includes a 15 percent Contingency allowance for this reason. This should promote the likelihood that the construction bid is within the proposed project budget.

Underground utility construction can encounter unforeseen conditions related to groundwater, soil conditions, or utility conflicts, despite thorough advance research and testing. In such cases, the Engineering consultant will assess the circumstances and formulate recommendations in consultation with ADLC relative to whether or not design modifications are necessary, and if the construction Contractor will incur additional labor or materials (i.e., costs). If time or payment allowed under the construction contract is affected, the owner may authorize adjustment by a Change Order to the contract. ADLC may need to seek concurrence from MDEQ for regulatory compliance and/or the NRD Program for eligibility under the approved project scope for grant reimbursement, before authorizing any Change Orders.

F. Monitoring Plan

Two phases of monitoring activities are proposed by ADLC during and following the project. During construction, quality assurance/quality control (QA/QC) monitoring will be conducted to assure that the work is implemented in conformance with the project goals and approved engineering design.

Once construction is completed, ADLC will initiate a separate monitoring effort to assess and quantify the results of the improvements in terms of reductions in water previously lost to leakage. This phase of monitoring is proposed to evaluate the cumulative leakage mitigation from the proposed East Third Street and South Birch project, plus that resulting from the four prior NRD-funded water main replacements. Those past projects include Main Street (funded 2002), East Fourth Street (funded 2003), and West Fourth Street (funded 2004) transmission main replacements, plus the Seventh, East Sixth and East Eighth distribution main replacements funded in 2005. Schedule I of the latter project will be constructed in 2006.

F.1. Quantitative and Qualitative Monitoring

F.1.a Construction (Qualitative) Monitoring

Construction-phase monitoring will be jointly performed by two parties: ADLC including its planning and utility departments, and ADLC’s contracted Engineering consultant for design, inspection, and construction administration. The roles of each are cooperative, as well as complementary.

ADLC’s staff will monitor the project, both in terms of contract conformance by its Engineering consultant and construction Contractor, as well as NRD Program compliance for project fiscal management and administration. Regular progress reports to the NRD Program will be submitted, and financial tracking will be conducted by ADLC, along with reviews of products and interim pay requests submitted by the project contractors. Project records will also be maintained by ADLC to provide an accurate project history.

The Engineering consultant's services will include field inspection during construction, assisted as necessary by personnel from the ADLC Water and Streets and Roads Departments. Engineering inspection will include full-time observation by the consultant's personnel for all water line construction activities; review of construction schedules, shop drawings, and test data for materials; a written daily Construction Diary; and a photographic log of construction progress. Construction-phase (field) monitoring will focus on compliance with design plans and specifications, and conformance to *Circular DEQ-1*, *American Water Works Association* standards, and *Montana Public Works Standard Specifications*. The field inspector(s) also fulfill a crucial role in guiding resolution of any unanticipated construction problems related to other utility conflicts, maintenance of water service, and unforeseen conditions.

Another key aspect of project monitoring involves adherence to project schedules. The Engineering consultant's contract will include time-of-performance stipulations, requiring completion of design tasks in accord with the overall project schedule. The construction bid documents likewise will include an allotted performance time, after which liquidated damages from the construction Contractor become payable to ADLC.

To maintain schedules, ADLC will closely monitor the progress of its Engineering consultant. ADLC will likewise require a detailed schedule from its construction Contractor, which will be regularly verified to assure timely project completion. In the event of schedule slippage, the Contractor will be required to submit revised scheduling, including any acceleration measures as may be necessary. Liquidated damages, if assessed, are intended to compensate the owner for additional costs incurred due to late completion (i.e., loss of use of the project and additional staffing and inspection time that may result).

Construction monitoring will also include requirements for "as-built" drawings providing an accurate record of the new construction. These will be prepared by the Engineer, based on field observations and measurements taken by its field inspector, supplemented by mandatory measurements and records maintained by the Contractor. "As-built" drawings will be furnished to ADLC, the MDEQ, and the NRD Program (if requested).

F.1.b. Leakage (Quantitative) Monitoring

Since the 2003 construction of the Main Street transmission main replacement funded by the NRD Program in 2002, ADLC has replaced 19,554 feet of old leaking water lines including the Main Street, East Fourth Street, and West Fourth Street transmission mains. With the forthcoming (2006) construction of Schedule I only of the Seventh, East Sixth and East Eighth Street distribution main project, the total footage replaced will increase to 26,994 feet, as summarized in **Table 3-1** on the following page.

Table 3-1 – NRD-funded ADLC Water Main Replacement Footage for 2003 through 2006

project & year constructed (NRD funding award prior year)	main sizes replaced (ft)						total (ft)
	4"	6"	8"	10"	12"	14"	
Main St. Transmission Main (2003)	50	550	284	3,330		100	4,314
East 4 th Transmission Main (2004)	187	465	279	36		5,178	6,145
West 4 th Transmission Main (2005)	8	1,049	128			7,910	9,095
Subtotal through 2005:	245	2,064	691	3,366	0	13,188	19,554
Seventh, E. Sixth & E. Eighth Mains - Schedule I only (2006)*	80	1,020	5,600		740		7,440
TOTAL:	325	3,084	6,291	3,366	740	13,188	26,994

* Schedule I construction scheduled for this year; Schedule II construction of 4,880 additional feet of main will occur in 2007.

In the *Preliminary Engineering Report – Municipal Water System* (PER) prepared by HKM Engineering in May 2004, an engineering evaluation of leakage was conducted (see PER pp. 14, 15, and 23 reproduced in **Appendix C**). This evaluation was based on 2002 data, and indicated a total water system leakage loss of 2,183,000 gal/day. The methodology used by the PER authors was a comparison of wastewater flows arriving at Anaconda's treatment facility (adjusted for groundwater infiltration) with water pumped from the well field for the month of January 2002. An assumption that 90 percent of water supplied should "return" to the wastewater facility was used, based on the absence of irrigation during the winter.

This 2.2 mgd leakage prediction is relatively consistent with a prior water master plan prepared by Robert Peccia & Associates in 1992 that estimated leakage at 1.9 mgd. The difference in these figures likely reflects two factors – different methodologies used by the respective engineers, and likely acceleration in leakage over the last decade as century-old *Kalimane* pipe further deteriorates.

It is important to note that the 2.2 mgd leakage quantified in the 2004 PER precedes the first of the NRD-funded water main replacements summarized in **Table 3-1**, since January 2002 data was used in the evaluation. This provides the opportunity at the end of 2007 to revisit overall leakage in Anaconda's distribution system after five successive years of major pipeline replacements, once the proposed East Third Street and South Birch main replacement and Schedules I and II of the 2005-funded Seventh, East Sixth and East Eighth projects are completed. At that juncture, another approximately 13,110 feet of main replacements will be installed, bringing the total footage replaced since 2003 to approximately 37,554 feet (26,994 ft. per Table 3-1 above plus 4,880 ft. for Schedule II of Seventh, East Sixth and East Eighth plus 5,670 ft. per this proposal).

The PER evaluation of 2.2 mgd of remaining leakage translates to approximately 26.2 gal/day of leakage per lineal foot of old pipe remaining in the system (72,910 ft. per Table 7-1 in PER, plus 10,459 ft. on Main and East Fourth Streets prior to the PER per Table 3-1 above). On this basis, the replacement of 37,554 feet of main by the end of 2007 theoretically could afford a leakage reduction of 984,000 gal/day (37,554 ft. x 26.2 gal/day). This is a "macro" approach, and ignores the obvious fact that leakage is not evenly distributed amongst all old mains in the system. Sizes and operating pressures potentially affect leakage from individual mains. It

nonetheless suggests that a post-2007 leakage reevaluation should show a discernible improvement.

F.2. Monitoring Data Collection and Rationale

Without consumer water metering yet in place throughout Anaconda, one of two other methods to evaluate leakage must be used. Either would be applied during mid-winter to avoid the effects of water use for lawn irrigation.

1. Comparison of wastewater treatment plant influent flow to well field water pumped during a mid-winter period (month), similar to the 2004 PER methodology.
2. Measurement of the drop in storage tank level over one or more individual winter nights while the well field pumps are turned “off”.

The existing well field water pumps are metered, providing a measurement of water delivered into the distribution system under either scenario. Use of Method 1, above, is recommended for two reasons. It allows a longer period for comparison (e.g., a full month), and also promotes the most consistent comparison with the 2004 PER analysis since the same approach was used therein. Overnight measurement of storage tank levels is a defensible technique, but can be biased by water left running by residents to avoid service line freeze-ups or by businesses that use continuous flow coolers or urinals.

Following 2007 construction of the proposed project, remaining water distribution system leakage would be evaluated using the same methodology as used by HKM Engineering in the 2004 PER. January 2008 data would be used for the analysis, and daily well field pumping flowmeter readings would be compared to daily wastewater treatment plant influent measurements. These data will be available from the ADLC Water Department and ADLC Wastewater Department, respectively.

ADLC is currently underway with an upgrade to the headworks at its wastewater treatment plant. This approximately \$300 thousand project involves installation of a new mechanically cleaned bar screen, and is being funded by the City-County’s Sewer Enterprise Fund. After bidding, the project is slated for construction in late summer 2006. As part of these improvements, the City-County is also replacing the ultrasonic flowmeter that registers influent flows arriving at the plant through a Parshall flume. The old meter dates from 1984 and need updating. Data collected with the new flowmeter will be used in the water system leakage analysis, and as such, the cost of the new wastewater influent flowmeter is being proposed as part of ADLC’s local match in this grant proposal (see Criteria Statement 14 and Step 6 - Proposal Budget).

Once retrieved, water supply and wastewater influent data will be plotted and compared, using methodology similar to that presented in Chapter 3, Part B.1.b of the PER. An assumed wastewater collection system infiltration allowance would have to be applied, and the 500 gal/day per inch-diameter-mile allowance used in 2004 will be reevaluated. Current collection system infiltration will be estimated by comparison of seasonal wastewater plant flowrates with static groundwater elevation measurements, where available. An assumption that groundwater depths exceeding six to eight feet are not conducive to sewer infiltration may provide a basis for excluding certain geographic areas of the collection system from an updated infiltration

allowance. The PER assumption that 90 percent of water supplied “returns” as sewage will also be reviewed and adjusted if necessary.

The results of the calculative comparison between water pumped and wastewater “returned” will then yield an updated estimate of remaining leakage in Anaconda’s water distribution system. The updated leakage calculation can be compared to the 2002 result of 2,183,000 gal/day to assess what reduction in leakage has occurred as a result of five year’s of major main replacements.

It is anticipated that a leakage reduction of between 0.3 and 0.7 mgd may result from such monitoring. The aforementioned 984,000 gal/day in reduced leakage based on 26.2 gal/day per foot of remaining old pipe will probably not materialize exactly. As part of the proposed reevaluation, a comparison of leakage per “inch-diameter” and footage of pipe will also be considered, and may be more valid. An “inch-diameter” footage basis would additionally account for the reported tendency of some old mains to leak at pipe joints, recognizing that larger pipelines have more joint circumferential area.

Quantifying current remaining distribution system leakage relates directly to and is consistent with the proposed goals and objectives of the current project proposal, as well as those of the previously funded NRD proposals by ADLC over the past four years. Those goals and objectives have primarily been to reduce water lost to leakage as an offset to Anaconda’s inability to develop extensive new water supplies due to mining-related groundwater degradation.

Data used for the proposed post-project monitoring will be already generated by the ADLC Water and Wastewater Departments, as described above. The City-County will hire a Professional Engineer to conduct the analysis, and that individual will retrieve the data from those utility departments. The Engineer will also conduct any necessary field reviews or other data collection on static groundwater conditions as related to the wastewater collection system to reevaluate a likely sewer infiltration allowance.

After review and analysis of data and calculation of an updated water distribution system leakage estimate, the Engineer will document his/her findings in a Technical Memorandum, supported by the data and calculations used. At the City-County’s option, this Technical Memorandum can become an Amendment to the 2004 *Preliminary Engineering Report – Municipal Water System* prepared by HKM Engineering in May 2004.

The cost of engineering services for an updated water system leakage evaluation, conducted on the basis described above, is \$9,202.50. This assumes 72 person-hours of consultant services at \$125 per hour, plus travel expenses. Costs for the monitoring plan are further discussed in Step 6 - Proposal Budget, and **Table F-4** in **Appendix F** shows an itemized estimate for the professional services required.

F.3. Problems if Monitoring Data Indicate Objectives are Not Being Met

In the unlikely event that an updated evaluation of leakage does not show a discernible improvement in the integrity of the water distribution system, several contingent follow-up analysis would be recommended.

- To assure that the wastewater influent vs. well field pumping comparison was not biased by some unknown factor, one or several overnight storage tank drawdown tests could be conducted (Method 2 in F.2 - Leakage Monitoring, previous). While not anticipated to be necessary initially, using this method as a cross-check would be justified if initial results do not conform to expectations.
- In-field sonic or infrared leak detection using a specialty contractor could be used to determine if an undetected major water main leak(s) was skewing results of the updated leakage evaluation. A sonic listening study was conducted in 1992, and located and quantified numerous leaks ranging between 2 and 30 gal/min. Contractors remain available for such investigations, although costs can be significant. This method cannot locate and quantify all leaks, since “listening” success is subject to limitations and interferences from road noise, etc. Quantifying leaks detected in this manner is also a rather subjective determination. Gravel and cobble strata underlying much of Anaconda are also known to often prevent water main leaks from “surfacing,” precluding simple visual observation for leak detection.
- Testing of well field flowmeter accuracy could be necessary if inconsistent results are obtained in the updated leakage evaluation. Meter testing speciality contractors are available in southwest Montana for such work.

These supplemental analyses and investigations are not included in the cost estimate for post-construction monitoring, as cited above and itemized in **Appendix F**.

It is considered highly improbable if not impossible that the replacement of 37,554 feet of century-old *Kalimane* mains with known serious leakage will not discernibly reduce system losses. If an updated leakage evaluation does not support this presumption, the methodology used in the evaluation was likely impaired by unanticipated factors. In that event the focus would be on improving the leakage assessment methodology, rather than abandoning future water main replacements. ADLC’s leak repair history (see **Figure 3**, previous) alone substantiates that substantial leaks remain in the system, and waste significant amounts of water.

F.4. Coordination with Other Monitoring Activities in the UCFRB

An updated leakage evaluation of ADLC’s water distribution system does not directly relate or coordinate with other monitoring activities in the Upper Clark Fork River Basin. The monitoring is proposed as a sequel to a municipal water system improvement, as a “replacement” project for groundwater resources lost to the Anaconda community due to mining-related contamination.

The monitoring, while necessary, has a single purpose – i.e., to confirm the anticipated benefits of the proposed and prior projects to offset lost groundwater resources by extending Anaconda’s existing water supply. Environmental monitoring is not included, and the project does not entail “restoration” elements.

The proposed post-construction monitoring can be conducted unilaterally by ADLC and its consultants, and does not require coordination with other monitoring activities in the watershed. Results of the monitoring will be submitted to the NRD Program.

G. Qualifications of Project Team

The project team for the proposed improvements includes ADLC's planning, water and street utility staffs; and its yet-to-be-selected Engineering consultant and construction Contractor.

- ADLC's Planning Department includes a three-person staff, providing project planning, funding coordination, and management services for the City-County. The Planning Department is experienced with numerous similar utility upgrades, including NRD Program project administration for the 2001 Opportunity Groundwater Monitoring project, the 2003 Main Street and Bowman Field Water Distribution Upgrades, and the 2004-05 Fourth Street Water Transmission Main projects.
- The ADLC Water Department has similar past experience with numerous system upgrades over the past decade. Additionally the Water Department has been responsible for system operation since the days of Washington Corporation ownership. The department even has capability for limited water main construction in-house, and historically has performed such duties on smaller scale projects.
- The ADLC Streets and Roads Department has jurisdiction for roadways, storm, and sanitary sewers in the municipal area. As such, personnel from this department are well versed in pavement re-construction, as well as the facilities for storm and sanitary sewerage in the community. These personnel will assist with oversight for pavement removal and replacement, and utility locates or repairs relative to Anaconda's sewer systems.
- The ADLC Historic Street Lighting District #150 has two staff members responsible for operation and maintenance of the lighting system. That staff has fulfilled this role for many years, and is very experienced with operating and repair requirements of the 6,000-volt series wiring involved. Historic Street Lighting staff will be responsible for pole removal and replacement, new conduit and wiring, and any other construction-related repairs required for the system.
- ADLC has yet to select an Engineering consultant for design and construction management for the East Third Street and South Birch water main replacement project. The City-County will select a qualified firm according to "quality-based selection" criteria for professional services. The Engineering consultant will have staff Professional Engineers licensed in the State of Montana, as required for engineering of public water systems.
- Qualifications of the construction Contractor will be specified in the bid documents and evaluated in conjunction with bid proposals. Experience with comparable projects, adequate resources to meet the project schedule, state licensure, and bid, performance and payment bonding will all be required. Additionally the likelihood of encountering hazardous materials during water main excavation will require that Contractor personnel have OSHA 40-hour Hazardous Waste Operations Health and Safety Training.

H. References and Technical Documentation

H.1. References and Literature Cited

Anaconda Groundwater Injury Assessment Report, Deer Lodge Valley, (Dr. William Woessner, January 1995)

Anaconda Water System Improvements Program, (Robert Peccia and Associates, 1992)

ADLC Municipal Water System Preliminary Engineering Report (HKM Engineering, 2004)

Anaconda Well Field Source Water Protection Plan (Water and Environmental Technologies, LLC, April 29, 2003).

Capital Improvements Plan, Anaconda-Deer Lodge County, Anaconda, Montana, (Beard Environmental and Technical Assistance, LLC, July 2002)

2003 Community Survey Results, (Anaconda-Deer Lodge County, MSU Extension Service, Anaconda Local Development Corp., and Anaconda Environmental Education Institute, Sept. 2003)

Covenant 'Exhibit C' to Bill of Sale Effective December 27, 1996 by and between Atlantic Richfield Company and CH-Twenty, Inc.

Hearst Lake/Fifer Gulch Water System Preliminary Engineering Report (Robert Peccia and Associates, December 1996)

MDEQ Circular DEQ-1 – Standards for Water Works, (Montana Department of Environmental Quality, 1999)

MDEQ Circular PWS6 – Source Water Protection Delineation, (Montana Department of Environmental Quality, 1999)

Montana Public Works Standard Specifications for Construction, (Montana Contractors Association, 1996)

Opportunity Water & Sewer Feasibility Study - Draft, (Robert Peccia & Associates, January 2000)

Survey of Water, Wastewater, and Solid Waste Facility Rates in Montana (Morrison-Maierle, Inc., July 2, 2003)

West Valley Water & Sewer Feasibility Study - Draft, (Robert Peccia & Associates, January 2000)

H.2. Unpublished Materials

In addition to the published references listed above, leak repair work orders from the files of the ADLC Water Department were reviewed for the project corridors. These leak repair work orders were used in the compilation of leaks shown in **Figure 3** (previous), and are available for inspection by the NRD Program upon request. Additionally 1992 mapping of sonic leak detection results and quantification by Utility Service Associates and Robert Peccia & Associates was used in **Figure 3**, and is available on request.

A report on the February 2006 City-County audit by Newland and Company, P.C., is to be published by March 31, 2006. This report will document the audit findings already verbally conveyed to ADLC, including the Water Enterprise Fund cash reallocation necessary to restore required bond reserves and excess coverage. Once published, this report will be made available to the NRD Program upon request.

No other unpublished materials were used or referenced in the compilation of this proposal.

H.3. Maps and Photographs

The following figures appeared earlier in this section and on the following pages to illustrate the project location, corridor, and proposed improvement details:

- | | |
|--|--|
| Figure 1 (page 7) – | Project Location Map , showing area watershed, ADLC water facilities, and limits of groundwater contamination. |
| Figure 2 (page 8) – | ADLC Water Main Improvements Priorities established in <i>ADLC Municipal Water System Preliminary Engineering Report</i> (HKM Engineering, 2004). |
| Figure 3 (page 12) – | Project Corridor Map with proposed main replacements, connecting mains and leak incidence. |
| Figure 4A thru 4F –
(pages 42 - 47) | Proposed East Third Street and South Birch Water Main Replacements (Morrison-Maierle, Inc., Feb. 2006). |
| Photos 1 and 2 (page 10) – | Photos of South Birch Street corridor south of Eighth Street showing high elevation terrain reducing water pressure, and residences served. |
| Photos 3 and 4 (page 28) – | Photos of Rarus Railroad crossing on East Third Street showing railroad tracks and elevation drop east of tracks. |

H.4. Easements and Right-of-Ways

Right-of-ways for the East Third Street and South Birch water main replacements are in the public domain of Anaconda-Deer Lodge County. As such, no easements or additional right-of-ways are necessary for the proposed project, other than a Rarus Railway Company track crossing permit to be obtained prior to construction for the bored/cased water main crossing beneath the tracks (see Part C.5 - Permits and Regulatory Approvals).

(Insert MMI Preliminary Engineering Figures 4A through 4H – pp. 42 thru 47)

Step 4. Environmental Impact Checklist and Narrative

Applicant Name: Anaconda-Deer Lodge County

Project Title: East Third Street and South Birch Water Main Replacements

A. Environmental Impact Narrative

The Environmental Impact Checklist at the end of this section itemizes the anticipated effects to the physical and human environments during and following construction of the proposed project – replacing water distribution mains along East Third Street and South Birch, and construction of a water booster pump station on South Birch in Anaconda. Resources consulted to assess potential environmental impacts and suitable mitigation if required include the Montana Natural Resource Information System database (www.nris.state.mt.us), the National Historic Register (www.nr.nps.gov), Federal Emergency Management Agency (FEMA) floodplain maps, and similar construction experience by Anaconda-Deer Lodge County with water main replacement projects.

A.1. Physical Environment

Impacts to the physical environment resulting from the proposed project include both short-term transient impacts associated with the construction, and long term environmental benefits resulting from completion. Work will be confined to previously excavated corridors, where existing water mains and in some cases sewer lines presently are laid.

More reliable water delivery will benefit 208 project property owners along the corridors directly, as well as users throughout the eastern portion of the municipal area. Fire protection will be enhanced for area properties due to new hydrants and improved system reliability, and potential health risks associated with water contamination through pipe leaks will be eliminated. Reduced system leakage will benefit all ADLC water users by increasing availability of otherwise lost water. Replacement of East Third Street and South Birch water mains is estimated to save up to 54 million gallons of water per year. This represents an important resource conservation measure, and provides additional capacity for other beneficial uses. An indirect energy benefit also results from leakage reduction, in that electrical consumption for well pumps decreases.

No construction in or adjacent waterways is involved for the main replacement work. Portions of the project corridors are classified by FEMA as “Zone B” floodplain, meaning they lie between the limits of the 100-year and 500-year flood events, or could be subject to less than one foot of inundation during the 100-year event. These “Zone B” designations are confined primarily to the existing roadway corridors, and north lots along East Third Street. Only the road corridor is rated “Zone B” on South Birch Street, and there the roadway is largely un-paved, having gravel surfacing instead. The proposed project involves only underground construction, upon completion of which, the ground surface will be restored to pre-project elevations and conditions. Hence no permanent impacts to floodplains will result. Local floodplain permitting should not be required, given that no above ground structures are being constructed. The proposed South Birch booster station will be in an underground, sealed vault. Caution will need

to be exercised during construction along the corridors to minimize exposure of the work site to flooding in the event of a significant storm event.

No identified wetlands will be traversed or disturbed by the project. Likewise no Threatened or Endangered Species will be impacted, given that project disturbance will be confined to developed urban corridors with no wildlife or riparian habitats.

Of the 31 historic properties listed in the National Register for Anaconda, four sites lie along the project corridors. These include the Granite Apartments and the Lorraine Apartments in the 200 block of East Third, the Sheehan Boardinghouse in the 400 block of East Third, and the Methodist Episcopal Church of Anaconda at the intersection of East Third and Oak Street. The Goosetown Historic District (roughly bounded by Cedar, East Commercial, and Monroe Streets, and the Birch Hill Allotment) also encompasses the eastern nine blocks of the Third Street replacement. In this District historic architecture and structures are present. With water main work confined to street right-of-ways, no impacts to historic properties or the Historic District will result. Enhanced fire protection is a significant positive benefit for all historic properties in the area.

No archeological sites of significance are known to exist along the project corridors. The corridors are urban and have been disturbed previously on several occasions for road improvements and excavation of underground utilities. Should any potentially significant archeological findings be encountered during the course of project construction, work will be halted to allow assessment of such findings by qualified personnel, with full involvement of the State Historic Preservation Office.

A.2. Human Environment

Relative to the human environment, positive benefits will result both from short-term construction and the completed project. The construction phase of the water project is forecast to infuse approximately \$650,000 in wages for labor (40 percent of total construction cost), resulting in an economic stimulus to the local economy. Local tax revenue will also increase temporarily with the influx of construction activity, and the resulting county taxes on construction equipment.

Project results will promote public health and safety due to enhanced reliability of water service and distribution, plus increased availability of water otherwise lost to leakage. Optimizing the use of ADLC's current water supply has collateral economic benefits in deferring supply expansion and the associated cost until absolutely necessary. An important public safety benefit will also result from the project through improved area-wide fire protection with new reliable water mains, along with the localized benefit of new fire hydrants along the project corridors.

Some RCRA hazardous materials are anticipated to be encountered along the East Third Street corridor, where pipeline excavations cross the abandoned streetcar track bed. Creosote-impregnated ties, long ago paved over, and soils in contact with the ties are expected to require disposal in the ARCO Repository. Clean replacement fill from ADLC stockpiles will be used in these areas. Additional test excavations, soils testing, and a Phase I environmental assessment will occur during project design to confirm the likely extent of hazardous materials. An estimated 15 residential lots along East Third Street have also been reclaimed under the Community Soils program. When new water service lines are installed across boulevards to the

property line (curb stop) at these locations, underlying fill will be properly repositioned and clean replacement topsoil will be laid to a depth greater than the original remediation.

The local transportation network will benefit by eliminating future disruptions for leak repairs on the streets where new mains will be installed. Traffic disruption during construction will be mitigated by use of publicized detours, traffic control complying with MDT and local standards, and maintenance of access for residents and emergency vehicles. The Rarus Railway Company track crossing on East Third will be coordinated with and permitted by the railroad owner. New distribution mains will also minimize the risk of future catastrophic failures and resultant water damage to adjacent properties.

No identified cultural resources nor Prime and Unique Farmlands will be impacted by the project. No agriculturally or industrially productive areas lie along the project corridor, or will be impacted by the project. The water main corridors have been previously excavated on multiple occasions for past water and sewer main installations and repairs.

No parklands are present along the project corridors. The nearest is Benny Goodman Park, directly west of the Monroe and Third Street intersection. Fred Moodry Middle School is located along the south frontage of East Third Street directly west of Cherry Street. Here student safety will be provided by judicious restriction of access when construction dangers are present. Public access to excavation sites along all portions of the project corridors will necessarily be prohibited during construction to promote safety. A combination of construction signs and barriers will be used.

Availability of safe water service and fire protection will be maintained during construction. Temporary water services will be routed as necessary, taking precautions to assure that sanitary quality is maintained at all times. Individual fire hydrants will be temporarily removed from service to permit replacement or re-connection. The Anaconda Fire Chief and fire fighting personnel will be fully apprised and directly involved in all temporary hydrant closures to promote public safety.

No property takings or right-of-way acquisition are required along the water main corridors for the project.

A.3. Construction Impacts and Mitigation

Construction of the East Third Street and South Birch water mains will entail traditional pipeline construction methods, employing heavy equipment for trench excavation, backfill, and surface restoration.

Limited aesthetic and visual impacts typical of an underground utility work site will occur during the approximate six-month construction period. These adverse impacts will be transient in nature, limited to the duration of construction, and will not require mitigation other than maintenance of a clean orderly work site and adherence to the construction contract schedule. Following construction, the project corridors will be fully restored to the pre-project condition, including re-paving, re-installation of curbs and sidewalks, and seeding and mulching on unpaved disturbed areas.

Construction impacts to soil and surface water resources will be mitigated by use of erosion control measures (strategic soil stockpiling and silt fencing) around excavated areas to prevent sediment transport. Such construction measures will concentrate on prevention of siltation in the existing municipal storm drainage system which ultimately drains to Warm Springs Creek. The construction Contractor will likely be required to obtain a construction site storm water management permit from MDEQ, since the area of disturbance within the project corridor could exceed the one-acre exemption. Asphalt paving on most portions of the corridors will also help reduce erosion potential. Full restoration following pipe installation to the pre-project condition, including roadway and boulevard areas, will mitigate any temporary surface disruption during construction. ADLC will itself restore all Historic Street Lighting affected by construction, as part of its local match.

Potential transient impacts to human health and safety during construction will be effectively mitigated by proper fencing and signage at the work site to protect against public entry and hazards. Blasting is not anticipated to be necessary for trench excavation, as the new mains will follow previously excavated corridors now occupied by the existing pipelines.

Business and residential access during construction can be maintained from adjacent parallel and cross streets while work progresses along the corridors.

Transient air quality and noise impacts due to operation of construction machinery will be attenuated by haul road watering and proper operation and maintenance of equipment. State of Montana air quality standards for fugitive dust emissions govern such releases, and will be enforced. Noise impacts may cause localized disturbance, but can be minimized by limiting equipment operation to traditional work hours. The East Third Street corridor is an arterial street already characterized by moderate traffic levels, thereby reducing noise impact sensitivity.

Construction work will be executed in full compliance with OSHA standards, including designation of the job sites as “hard hat areas,” and trench excavation and other work place safety conforming to applicable requirements. Public access to the construction site(s) will be strictly prohibited. Particular care and special precautions will be warranted while work occurs along the Fred Moodry Middle School. A jobsite safety plan will be solicited from the construction Contractor to assure adequate barriers and protection for students are provided, both during and after work hours. Contractor personnel will likely be required to have OSHA 40-hour Hazardous Waste Operations Health and Safety Training, given the probability of encountering creosote materials (ties) in excavated crossings of the old streetcar track bed on East Third Street. The Contractor will be assigned contractual responsibility for all job site safety and regulatory compliance.

Protection of public (sanitary) health during construction, specifically isolation and replacement of existing water mains and services, will be provided by adherence to MDEQ *Circular DEQ1* and *Montana Public Works Standard Specifications* requirements for thorough disinfection and bacteriological testing of new water mains. Such testing will likewise apply to temporary conveyance piping provided to maintain water service to residents during construction. Adherence to these standards and requirements will be legally required in the construction contract.

B. Potentially Adverse Impacts

No long-term adverse impacts to the physical or human environment are anticipated. Potentially adverse impacts noted on the following Environmental Impact Checklist for the Physical Environment and the Human Environment are limited to transient impacts associated with the construction phase of the project, and suitable mitigation.

B.1. Reasonable Alternatives to Avoid Impacts

No reasonable alternatives are available to avoid the identified transient construction impacts, beyond the mitigation described previously in Part A.3, other than not constructing the project. Given that the identified mitigative measures are effective and proven from other similar underground utility projects, cancellation of project construction is not warranted.

B.2. Appropriateness of Mitigation

Effective mitigation for these construction impacts is discussed previously in Part A.3. The measures identified therein represent the recognized norm for mitigation on similar utility construction projects. Adherence to these measures is also intended to meet state and federal regulatory requirements governing such construction.

Environmental Impact Checklist:

Impacts to <u>Physical Environment</u>	No Impact	Potentially Adverse	Potentially Beneficial	Permits or Approvals Required	Mitigation Required
1. Soil suitability, geological or topographic constraints	X				
2. Air Quality		X (CO)			X (CO)
3. Groundwater resources and quality			X		
4. Surface water quality, quantity and distribution systems		X (CO)		X (CO)	X (CO)
5. Floodplains and floodplain management	X				
6. Wetlands protection	X				
7. Terrestrial and avian species and habitats	X				
8. Aquatic species and habitat	X				
9. Vegetation quantity, quality and species	X				
10. Unique, threatened or endangered species or habitats	X				
11. Unique natural features	X				
12. Historical and archeological sites			X		
13. Aesthetics, visual quality		X (CO)			X (CO)
14. Energy resources, consumption, and conservation			X		

(CO) = Transient environmental impact anticipated and/or mitigation required during project construction only.

Comments: No long-term adverse impacts to the physical environment are anticipated. Effective mitigation is proposed for transient construction-phase impacts identified, as described in Part A.3 - Construction Impacts and Mitigation in the preceding narrative.

Impacts to <u>Human Environment</u>	No Impact	Potentially Adverse	Potentially Beneficial	Permits or Approval Required	Mitigation Required
15. Human Health and Safety		X (CO)	X		X (CO)
16. Agricultural or industrial production	X				
17. Access to recreational activity, public lands, open space	X				
18. Nuisances (odor, dust, glare)		X (CO)			X (CO)
19. Noise (e.g., separation between housing and construction areas)		X (CO)			X (CO)
20. Hazardous substance handling, transportation and disposal		X (CO)		X (CO)	X (CO)
21. Local and state tax base and tax revenue			X		
22. Employment, population, or housing			X		
23. Industrial and commercial activity			X		
24. Land use compatibility; consistency with local ordinances, or solutions, or plans			X		
25. Demands for Governmental services (e.g. site security, fire protection, community water supply, wastewater or storm water treatment, solid waste management)			X		
26. Transportation networks and traffic flow		X (CO)	X		X (CO)
27. Social structures and mores	X				
28. Cultural uniqueness and diversity	X				

(CO) = Transient environmental impact anticipated and/or mitigation required during project construction only.

Comments: No long-term adverse impacts to the human environment are anticipated. Handling of hazardous materials and contaminated soils during trench excavation along the old streetcar rail bed is anticipated, and will be accomplished in compliance with all RCRA and OSHA requirements. If/as necessary, consultation with also occur with the MDEQ, USEPA, ARCO, and the NRD Program.

Step 5. Criteria Statements

Applicant Name: Anaconda-Deer Lodge County

Project Title: East Third Street and South Birch Water Main Replacements

STAGE 1 CRITERIA - General Legal Criteria

1. TECHNICAL FEASIBILITY

The proposed project is technically feasible, utilizing traditional utility construction methods for underground pipelines and mechanical water booster pump stations. Temporary water service provisions will be included in the construction sequence to assure uninterrupted water availability to consumers. Technical feasibility is addressed in detail in Step 3 - Technical Narrative.

2. RELATIONSHIP OF EXPECTED COSTS TO EXPECTED BENEFITS

2.A. Description and Quantification of Direct/Indirect Project Costs

The estimated direct cost of the East Third Street and South Birch Water Main Replacements is \$2,028,342. Of this total project budget, Anaconda-Deer Lodge County proposes to leverage \$1,964,263 in UCFRB Restoration Funds with local in-kind match for materials and staff services of \$64,080, including \$5,500 spent to date for preliminary engineering for the project.

These capital costs have been accurately projected, based on detailed itemized estimates prepared by qualified professionals, as described in detail in Step 6 - Proposal Budget and **Appendix F**.

No quantifiable indirect costs are attributable to the project. ADLC's staff services and other in-kind contributions to the project are quantified, and costs have been assigned to them.

2.B. Description and Quantification of Direct/Indirect Project Benefits

The proposed project will provide direct benefits to individuals living and working in Anaconda-Deer Lodge County, an area in the midst of the largest Superfund site in the United States. **The direct benefits of this proposed project will conserve and enhance the municipality's limited water resources as a surrogate for its impaired ability to expand its groundwater supplies.**

ADLC proposes to replace 5,670 feet of century-old leaky water mains East Third Street and South Birch, plus install a pressure booster pump station along the latter corridor to assure reliable water service for residents there. The line replacements will not only eliminate leakage along the old corroded pipelines promoting conservation, but will also dramatically improve reliability across the central tier of the east portion of the distribution system. The reduction in

leakage will also conserve energy in that water pumped into the system will drop commensurately, and additional water supply will not have to be developed prematurely.

A continuous water transmission main will be restored along the full length of East Third Street. The existing main is abandoned and discontinuous just east of Madison Street, resulting in a “dead end” in the 1200 block east of Monroe. The continuous replacement will strengthen water delivery and fire protection in the east central portion of the distribution system, and eliminating potential hazardous water stagnation.

Chronic leaks in the 300 and 400 blocks of East Third (see **Figure 3** in Step 3 - Technical Narrative) will cease. This will minimize future repairs and the associated disruption to pavement and traffic in this segment of the corridor, representing a long term cost savings.

The proposed upgrade of these water distribution mains represent a **replacement project**, rather than restoration for contaminated water resources. The improvements will promote **water resource preservation** (eliminate leakage) and **enhancement** (extended utility of existing uncontaminated water supplies).

As documented in the discussion of project goals and objectives in Part B of Step 3 - Technical Narrative, a direct benefit of conserving up to 148,500 gal/day currently lost to leakage is predicted. **Correcting this loss could realistically make 54 million gallons per year of previously wasted water supply available to the Anaconda community!** This amounts 2.25 percent of Anaconda’s total well field capacity, and 19 percent of non-irrigation water demand.

With an estimated production/delivery cost of \$1.07 per thousand gallons (based on an annual water utility budget of \$1.37 million), correction of even 20 gpm of leakage represents \$11,250 in annual primary benefits from upgrading the proposed waterlines. With the more realistic estimate of 54 million gallons of annual leakage along the project corridors, the **annual primary benefits of the project escalate to \$57,800!**

This savings approaches the annual equivalent cost of the \$2,028,342 project – \$82,800 at 4.0 percent interest and 100-year project life. Additionally the project will result in significant secondary economic and environmental benefits.

The project will also strengthen the City-County government’s ability able to meet the infrastructure needs of a developable community. Improved water system reliability creates related benefits of improved fire protection, reduced likelihood of catastrophic failures causing property damage or loss of water to consumers, and the quality of life typical of municipalities with modern utility services.

3. COST EFFECTIVENESS

3.A. Description of Alternatives

Replacing the East Third Street and South Birch water distribution mains with new ductile iron pipe along the same alignment provides improved service in the least costly manner, compared to other alternatives. Alternatives that have been evaluated are described in the 2004 PER and summarized below.

3.A.1. Alternatives to Water Main Replacement from the 2004 PER

To validate the selection of the recommended option of distribution main replacement, other alternatives were considered. The 2004 PER screened seven alternatives to address ADLC's water system deficiencies (Chapter 4, pp. 49-51), including the following:

- > Construction of Additional Wells in Same General Location
- > Construction of Additional Wells in Alternative Locations
- > Development of Surface Water Source – Hearst Lake/Fifer Gulch
- > Connection to Other Community Water Systems
- > Recovery of Capacity through Water Main Replacements
- > Initiation of Comprehensive Metering Plan
- > No Action

Of these, additional wells in alternative locations, connection to other community systems, and no action were screened out as infeasible. The PER evaluated and ranked the remaining four alternatives (see PER pp. 65-72 reproduced in **Appendix C**). Ranking was based on multiple criteria, and resulted in the following “scores” (PER Table 5-2, p. 71):

Alternative I – Rehabilitate Distribution System	+3
Alternative II – Install Water Meters	+2
Alternative III – Additional Wells at Existing Field	0
Alternative IV – Hearst Lake/Fifer Gulch Surface Water Source	-6

The PER concludes that distribution system replacement is the recommended immediate alternative, both in terms of enhancing water supply (by reducing leakage) and cost-effectiveness. Based on selection of this alternative, the PER outlined a seven-year main replacement program (see PER Table 3-6 reproduced in **Appendix B**). Alternative II, water metering, is included in the PER recommendations, and while protracting the years required for the main replacement program, is likewise recommended as a second water system priority. System-wide metering was proposed over a two-year period beginning in 2007, but has been rescheduled to single-year implementation in 2009. This schedule adjustment was made by recent ADLC Commission Resolution No. 06-07 to allow an advance public education program and pursuit of funding (see discussion in Part A of Step 3 - Technical Narrative). The total cost estimated in the PER for metering the system is \$2,084,168.

3.A.2. Description of the “No Action” Alternative

A course of “no action” relative to awaiting natural recovery of the area's impaired groundwater resources is infeasible, given EPA's prognosis that such recovery may never occur (see Part B.1 in Step 3 - Technical Narrative). Without natural recovery of Anaconda's groundwater, preservation of existing water resources is the only surrogate remedy.

A “no action” alternative in terms of not upgrading the East Third Street and South Birch water mains has been deemed unacceptable by Anaconda-Deer Lodge County. It is not responsive to the identified problems and project goals, nor does it conform to ADLC's adopted water master plan (PER). It is contrary to the community's long-term commitment to provide an ample, sustainable water supply that meets regulatory standards. To not replace these 100-plus year old leaky water mains would be irresponsible. With the community's water resources stringently limited because of mining-related contamination and restrictive covenants for groundwater

development, the City-County must pursue every measure available to preserve and extend its finite resources.

To retain these leaking water mains would be to knowingly allow as much as two percent of ADLC's total water supply to merely seep away unused. The community needs to not only preserve its resources, but also provide increased water availability in response to growth. Water main leakage also represents a potential threat to public health and safety in terms of possible entry of contaminants through breaches in existing water mains. Doing nothing perpetuates these risks, and likewise forfeits a viable and cost-effective option to replace lost resources and extend the utility thereof. The "no action" alternative is both environmentally irresponsible and non-responsive to the problems identified with the existing East Third Street and South Birch water mains. **The existing mains are already well past any reasonable life expectancy, and catastrophic failure becomes more likely if they are retained in service into their second century.**

The "no action" alternative would not entail any capital outlay. Future operating and maintenance expenditures could be expected to continually increase due to the cost of ongoing main repairs, plus pump electrical power and chlorine to disinfect water lost to escalating leakage. Accelerating leakage with time would deprive consumers of increasing amounts of water. Eventually catastrophic failure of mains could result, rendering the bulk of water users along the project corridors without water supply or fire protection.

Abandoning the East Third Street and/or South Birch water distribution mains is likewise an unacceptable option. Such a radical approach is not responsive to identified project goals, and would deprive 208 residential and commercial water users of service.

It has been empirically determined from past system operating experience, particularly during recent construction projects for the Fourth Street transmission main, that sustaining water delivery to residents on South Birch is not possible. Chronic low pressure problems also recur during each irrigation season, due to high water demand through the system. The problem results from the high elevation of residences on South Birch, compared to the 3.5 million gallon storage tank that provides pressure to the system. A "no action" alternative relative to adding a pressure booster station for the South Birch corridor would do nothing to remedy these existing problems.

3.A.3. Recommended Construction Alternative – Conventional Main Replacement and South Birch Water Booster Station

The 2004 PER does not compare alternate construction methods for the main replacements recommended therein. For this reason, specific construction alternatives have been compared for the East Third Street and South Birch water main replacements, as described in the following section.

Conventional replacement of the existing water mains East Third Street and South Birch is recommended on the basis of serviceability, resource conservation, and long term cost efficiency. As reflected in the PER, these segments are priority replacements in Anaconda's distribution system.

Conventional replacement as proposed would entail trench excavation and installation of new eight-inch ductile iron main along East Third Street, and new six-inch main on South Birch. Existing distribution lines crossing the mains would be re-connected, along with new fire hydrants and user service taps. The East Third Street replacement will connect to the new 10-inch transmission main replaced on Main Street in 2003 with 2002 UCFRB Restoration Funds. Likewise the South Birch Street segment will connect to the 2005 NRD-funded East Eighth Street main upgrade (see **Figure 3** in Step 3 - Technical Narrative).

A total of 5,670 feet of new eight- and six-inch mains will be installed, along with connections at intersections, eight fire hydrants, and 208 service connections. **A preliminary design has been prepared by Morrison-Maierle, Inc. to better define project costs and support this application. Figures 4A through 4F** (appearing at the end of Step 3 - Technical Narrative) were prepared as part of this analysis, and show the proposed engineering layout for the East Third Street and South Birch main replacements. As shown in those preliminary engineering drawings, new mains would follow existing pipelines, possibly offset several feet in localized areas to facilitate installation. The proposed South Birch Street replacement south of Eighth Street is shown in **Figure 4F**. The \$5,500 cost of the February 2006 preliminary engineering for this project was paid by ADLC as part of its proposed local match for NRD grant funds.

Based on the preliminary design by Morrison-Maierle, Inc. for the project, a booster pump station is proposed on South Birch, near its intersection with East Eighth Street (see **Figure 4F** appearing at end of Step 3 - Technical Narrative). This pump station would be housed in a subsurface concrete vault at the west edge of street right-of-way. Within the vault, duplex electric centrifugal pumps with firm capacity of up to 200 gpm would boost water pressure into the new South Birch line when upstream (East Eighth Street) water main pressures dropped to a preset level. Pump controls would be adjusted to assure that a nominal 40 psi is provided to the uppermost South Birch residences at all times in accordance with *American Water Works Association* recommendations. The booster station addresses the pressure/water loss problems in the most cost-effective manner for the 15 existing water users along South Birch, and complies with MDEQ *Circular DEQ1* design standards.

Contracted services costs for the recommended conventional main replacement and booster station alternative are projected at \$1,969,763, including \$1,700,052 for construction and contingencies. A construction cost estimate for this alternative was prepared as part of the preliminary design for this project, and is presented in detail in **Table F-3** in **Appendix F**.

The critically needed East Third Street and South Birch water main project represents the best use of ADLC's limited water resources, and maintains the function and current configuration of the distribution system.

3.B. Other Construction Alternatives – Not Recommended

3.B.1. Other Water Main Replacement Alternatives

For the water main replacement portions of the East Third Street and South Birch project, two other alternatives were considered in the course of preparing this application:

- > Main Replacement Along Other Alternate Corridors
- > “Trenchless” Water Main Replacement

Given the established homes and businesses served along the East Third and South Birch Street corridors, providing new mains in alternate locations rather than along the current corridors is infeasible. As shown on **Figures 4A** through **4F** (appearing at the end of Step 3 - Technical Narrative), 208 service connections will be restored along the proposed project corridors. Providing new mains along other different streets and extending existing service connections *en masse* is impractical both in terms of cost and the easements that would be required across private lots to access alternate main locations.

Advancements in new “trenchless” technology for underground main replacements now permit pipe-bursting or slip-lining pipe rehabilitation in place, without open trench excavation. Although primarily in use for sewer mains, this technology has recently also expanded to water conduits (subject to limitations of materials compatible with potable water service). Slip-lining is constrained to the existing pipeline diameter, and finished diameter actually decreases by the wall thickness of the liner material. Pipe-bursting technology is also available, and maintains (or can enlarge) existing pipe diameter. Both technologies can utilize high density polyethylene (HDPE) as the replacement pipe material. All piping connection points including services must be open-excavated with either technology to permit fitting placement.

Either of these “trenchless” construction methods would have only limited application for the East Third Street and South Birch water main replacements. Neither are generally practical to install in existing “host pipe” diameters less than eight inches, and are typically better suited to larger pipelines. The South Birch main replacement, proposed as new six-inch line to replace existing four-inch pipe, would require conventional open excavation. Additionally all 208 water service taps, eight fire hydrant connections, 47 valves, and eight intersecting main connections would each require “spot excavations” with pavement restoration. Collectively this extent of excavation largely defeats the purpose of “trenchless” replacement for this project, and favors conventional construction methods.

Furthermore if slip-lining were used, the existing eight-inch line on East Third Street would suffer up to a 1.5-inch diameter reduction, and the existing six-inch segments there could not be up-sized. The better flow characteristics of the HDPE liner would offset some of the loss in capacity, but the resulting hydraulic performance would nonetheless be inferior to conventional main replacement with new eight-inch ductile iron pipe.

Unit (per footage) cost for “trenchless” pipeline rehabilitation options are relatively high due to the specialized equipment and mobilization required. Typical slip-lining costs would be \$100 to \$150 per lineal foot, compared to the \$40 per foot (plus excavation) estimated for conventionally installed new piping (see **Table F-3** in **Appendix F**). “Trenchless” technology has typically proven cost-effective only in densely developed (e.g., commercial) districts where open street excavation is prohibitive in cost. However it is not considered practical or cost-effective for the East Third Street and South Birch water mains. Uncertainties relative to technical feasibility and regulatory acceptance of this construction method for water lines may also be problematic, given the newness of the technology.

Conventional main replacement is most cost-effective in terms of capital outlay, and corrects the current leakage and deterioration problems. Traditional excavation methodology will expedite project construction, promote in-state participation and competition in bidding, and preserve the current function and configuration of the water system. For these reasons conventional main replacement with new eight- and six-inch piping along the current alignments is recommended.

3.B.2. Alternatives to South Birch Water Booster Station

Other than the recommended central booster station alternative or the “no action” option, two other alternatives were considered to address the South Birch water pressure problem:

- > Over-sizing New Water Main to Reduce Pressure Loss
- > Individual “In-house” Booster Pumps

In lieu of using new six-inch pipe for the 700 feet of replacement main proposed along South Birch Street, a larger diameter could be considered to reduce pressure losses. However after analysis, this alternative does not correct the pressure loss problem. For a design flow of 200 gpm (15 residences at 13 gpm), pressure losses through the proposed six-inch pipe are only approximately 1.6 psi. Increasing the replacement main size to eight-inch diameter would create 0.4 psi of loss, an inconsequential difference. Terrain rises over 80 feet along South Birch Street, representing 35 psi of elevation head. Pressure problems for upper Birch Street residents range from “no water” to substandard pressures below 20 psi. Hence improving headloss characteristics in the new water main by approximately 1.2 psi will not obviate the need for booster pumps.

Individual “in-house” booster pumps were also considered for the 15 South Birch Street residences. These are available commercially as “packaged” units, and can be plumbed in where the water service enters the basement or first floor of the dwelling. Units for the desired flow condition (e.g., 13 gpm at 60 psi) would typically be 0.75 hp, and would include a small integral hydropneumatic tank and pressure controls. Installed cost is estimated at \$4,650 per unit, representing a \$69,750 solution for the 15 residences involved (ref. *Site Work & Landscape Cost Data - 23rd Annual Edition*, R.S. Means, 2004). This compares to \$82,000 estimated for the recommended central booster station (see **Table F-3** in **Appendix F**).

However despite the potential cost savings, in-house booster pumps will not satisfactorily address the problem, and are not considered a viable alternative. Such pumps require limited residual pressure on their suction side, to force water into the pump. During episodes observed during the summer of 2005 when upper South Birch residences had no water, in-house booster pumps would see “starved suction” conditions, delivering no water and likely sustaining permanent damage (water flow through pumps is essential for cooling). The recommended central booster station near the intersection of East Eighth and South Birch eliminates this problem, in that water pressure would always be available to the suction side of the pumps because of the lower elevation.

In-house booster pumps would be capable of providing the desired pressure increase, but only when water is available at the pump suction. Hence the individual in-house booster pump alternative is not recommended, as it does not fully address the observed South Birch water pressure problems.

3.C. (If) Selected Alternative Does Not Provide the Greatest Net Benefit

The recommended alternatives of conventional replacement of East Third Street and South Birch water mains and a central booster station on South Birch do provide the greatest net benefit, compared to the other alternatives considered. The main replacements also conform with the recommendations in the 2004 PER.

The comparative evaluation in the PER established that water main replacement is the most cost-effective alternative for Anaconda with the potentially greatest positive benefits to overall system demand (see PER pp. 71-72 reproduced in **Appendix C**).

4. ENVIRONMENTAL IMPACTS

This criterion is addressed under Step 4 in the Environmental Checklist and Narrative; therefore, no additional response is included here.

5. HUMAN HEALTH AND SAFETY IMPACTS

This criterion is addressed under Step 4 in the Environmental Checklist and Narrative; therefore, no additional response is included here.

6. RESULTS OF SUPERFUND RESPONSE ACTIONS

6.A. Identification and Description of Any Ongoing and Planned Response Actions

The Superfund process has identified large areas of contaminated soil and water that directly affect the Anaconda-Deer Lodge community. Several hundred million cubic yards of tailings resulted from the mining-related activity in the area. In addition to contaminant plumes from Smelter Hill, Anaconda Ponds, Warm Springs Ponds, Silver Bow Creek, the Blue Lagoon and the Yellow Ditch, spring runoff in the streams and creeks in the area continues to supply high concentrations of metals to groundwater along their reaches. Since this runoff is a source of recharge within the area, there is an ongoing probability of groundwater contamination from these sources. Groundwater modeling (Dr. William Woessner, 1995, *et.al.*) has identified extensive contamination zones adjacent Anaconda, and encroaching into the community proper (see **Figure 1** in Step 3 - Technical Narrative). Volumes of groundwater contaminated in exceedance of *Primary* and *Secondary Drinking Water Standards* for various metals are projected to be excessive (see **Appendix D**).

The prognosis from extensive testing and analysis is that many acre-feet of groundwater in the area cannot be remediated. While various response actions are being both contemplated and implemented for the Butte-Anaconda Superfund site(s), these actions will not restore the groundwater resources lost to Anaconda for municipal water supply. Consequently ADLC must maximize use of its existing water resources, conserving them and extending their availability wherever possible.

6.B. Description of How the Proposed Project Coordinates with Ongoing or Planned Response Actions

6.B.1. Relation of Project with Response Actions

As a “replacement” rather than “restoration” project, the East Third and South Birch water main replacements will proceed independently of ongoing or planned CERCLA response actions relative to the Butte-Anaconda Superfund site(s). The project will not interfere with or affect other remediation or response actions. Construction work will be confined to the East Third and South Birch Street corridors within the Anaconda municipal area. The project environ is characteristically urban in nature, with established residential, institutional, and commercial development.

Hazardous waste materials (i.e., creosote from abandoned streetcar track ties) are suspected to exist along the East Third Street work corridor, and further materials testing and a Phase I environmental assessment will be part of project design. Construction documents will include provisions for identification and special handling of any hazardous materials encountered in the course of excavation, with disposal in the ARCO Repository. Any other unanticipated hazardous materials encountered will be addressed with full involvement by and at the direction of the USEPA and MDEQ, ARCO, and if required, the NRD Program.

6.B.2. Project Augmentation of Response Actions

While providing no direct augmentation of ongoing or planned response actions, the project will provide an indirect, positive supplement to other remedies underway in the Butte-Anaconda Superfund corridor. By enhancing domestic water availability and supply to the residents of Anaconda, it will provide a beneficial offset to groundwater degradation that has restricted availability of water resources in the area.

6.B.3. Need for Resultant Response Actions Due to Project

The proposed East Third Street and South Birch water main replacements will not result in the need for any additional or resultant response actions.

Limited hazardous materials (i.e., creosote) are anticipated to be encountered during trench excavations crossing the abandoned streetcar rail bed along East Third Street. As described above, proper handling per regulatory requirements, and disposal in the ARCO Repository will be required in the construction contract.

7. RECOVERY PERIOD AND POTENTIAL FOR NATURAL RECOVERY

7.A. Potential for Natural Recovery of the Natural Resource and/or Services Addressed

Because of the overwhelming cost and work involved in remediating the largest Superfund site in the United States, the EPA has chosen to cap the waste and allow groundwater contamination to remain without any direct remedial action. While surface reclamation should reduce infiltration through the waste material, over 40 square miles of contamination continues to injure the groundwater resource. This has resulted in the persistence of groundwater contamination and,

more importantly to the Anaconda community, limited availability of water resources to meet the existing and future needs of the residents. Natural recovery of contaminated water resources has been discounted, due partly to the magnitude of the problem (Woessner, 1995, *et.al.*). For Anaconda, this loss is substantial and irreversible. Therefore, Anaconda-Deer Lodge County's response must be to preserve existing uncontaminated water resources, and enhance their utility as far as practical.

7.B. Description of How the Proposed Project Would Enhance the Time Frame for Natural Recovery

Prospects for natural recovery of contaminated groundwater resources are unlikely, as discussed previously. In lieu, promoting efficient utilization of Anaconda's remaining usable groundwater provides resource "replacement" and an alternative to natural recovery. By minimizing system leakage and optimizing water availability to consumers, remaining uncontaminated groundwater resources will be conserved and their use will be extended for decades, whether measurable natural recovery occurs or not.

8. APPLICABLE POLICIES, RULES AND LAWS

Anaconda-Deer Lodge County has the legal authority to enter into a binding contract with the State of Montana to authorize funding for the proposed project. ADLC will comply with all applicable state and federal laws and regulations in the completion of this project. Because this project is for a public water system, MDEQ design and approval protocol will be followed for the water main improvements.

8.A. Identification of Permits or Other Regulatory Approvals

As identified under "Permits, Access, and Regulatory Approvals" in Section C.1.d of the Technical Narrative, MDEQ jurisdiction over public water systems will require construction plans and specifications approval by that agency. A Professional Engineer licensed by the State of Montana must be in "responsible charge" of preparation of the water improvements design. Following completion of construction, the Engineer must also file with MDEQ a Certification of Completion in Accordance with Approved Plans and Specifications.

Other permitting anticipated for execution of the project is limited to a railroad right-of-way crossing permit required from the Rarus Railway Company, owners of the railbed crossing East Third Street at Madison (see **Figure 4D** at end of Step 3 - Technical Narrative). Modern design practice for underground utility crossings of railbeds includes a casing pipe to provide for maintenance access and future replacement of the utility line. An existing abandoned main at this crossing is apparently un-cased and is currently unusable. Based on ADLC's experience with a similar crossing installed in 2004 for the East Fourth Street transmission main project, no fee is anticipated to be assessed by the railway company for the crossing permit. Advance consultation with Rarus by ADLC and the Engineer will precede final design, and that design will reflect any specific railroad company requirements. The track crossing permit will be secured prior to advertising for construction bids on the project.

ADLC owns all other right-of-way needed for the project, specifically dedicated public street and utility right-of-way along the project corridor.

Compliance with permitting requirements is anticipated to proceed according to the Project Time Schedule (Section D of the Technical Narrative), and is summarized below:

Engineering consultant contract execution	December 15, 2006
Completion of design plans and specifications	March 16, 2007
MDEQ approval of water main plans and specifications	March 30, 2007
Rarus Railway Company track crossing permit secured	March 30, 2007
Construction bid advertisement	April 1 - 20, 2007
Final completion of construction	November 16, 2007
Certification of completion to MDEQ by Engineer	December 17, 2007

Other than concurrence by the NRD Program that the Engineer's completed design plans conform to the project scope contained in this application, no other permitting or approvals are anticipated to be required for the project. ADLC will enter into a grant contract with the NRD Program, and abide by the conditions therein. The City-County will submit regular Progress Reports to the NRD Program, along with a Final Project Report ("Attachment D") upon completion.

8.B. Coordination with Local Entities

8.B.1. Local Government Entities

ADLC as a combined city-county government resolves any county coordination requirements by default. Coordination with the State of Montana, both through the NRD Program and the MDEQ, will occur according to all statutory and UCFRB Restoration Fund requirements. This coordination will include compliance with all agency requirements, and opportunities for construction document review and construction-phase field inspection. Fiscal project management and record keeping will conform to all NRD Program requirements.

Anaconda-Deer Lodge County will also coordinate with the USEPA, MDEQ, and as necessary ARCO, in the event that any excavated materials unexpectedly contain heavy metals in excess of remedial action levels. Such materials would be removed to an approved waste repository, and clean backfill materials would be utilized in that event.

8.B.2. Local Government Requirements

The proposed East Third Street and South Birch water main replacement project is consistent with the adopted policies of the City-County, in particular the 2004 PER and the 2002 *Capital Improvements Plan for Anaconda-Deer Lodge County*. Both documents reflect the administrative priority on water system improvements, and particularly leaking main replacements.

Project design and construction will be coordinated to interface with other ADLC municipal infrastructure, including roads and streets, sanitary and storm sewers, emergency services, and Historic Street Lighting. Involvement of representatives of these City-County departments will occur during design as well as construction. Monthly construction progress meetings will provide a forum for resolution of any post-design coordination issues.

8.B.3. Weed Management

No land management activities are anticipated. Work will be confined to urban corridors. During design, in consultation with the Engineer and at the discretion of the ADLC Weed Control Department, a weed management plan requirement may be included in the project bid documents governing the Contractor's activities. The City-County Weed Control Department administers eight weed control districts in Deer Lodge County, including the Anaconda District.

8.C. Other Applicable Laws and Rules, Policies, or Consent Decree Requirements

The municipality will not only comply with the MDEQ approval process, but will also utilize the *Montana Public Works Standard Specifications for Construction* in the implementation of the proposed project. This includes compliance with approved construction practices, safety measures, and environmental requirements (including dust, runoff, and noise abatement) during construction. ADLC will procure professional engineering services for the project through a competitive, quality-based-selection process as prescribed by state law. Construction contractor selection will use a publicly advertised, competitive bid process as statutorily required.

No other ramifications of the proposed project to laws, rules, policies, or Consent Decree requirements are anticipated.

9. RESOURCES OF SPECIAL INTEREST TO THE TRIBES AND DOI

The East Third Street and South Birch water main project is confined to urban residential and commercial corridors previously disturbed by construction activities. No Tribal lands, nor any wildlife, wetland, or riparian habitats are present. Therefore, it is anticipated that this project will have no adverse impacts on resources related to Tribal Nations, or the Department of Interior - U.S. Fish and Wildlife Service.

ADLC acknowledges that appropriate actions and consultation with Tribes and/or the Department of Interior will be required if any unanticipated Resources of Special Interest relative to those entities are encountered in the course of executing the project.

STAGE 2 CRITERIA - General Policy

10. PROJECT LOCATION

The proposed East Third Street and South Birch water main replacements are located within the urban area of Anaconda, along the western extremity of the geographic area where groundwater resources have been damaged and are designated as contaminated. The project corridors lies in Sections 2, 3 and 10, T4N, R11W. **Figures 1 and 3** appearing in Step 3 - Technical Narrative show the project location and corridor.

11. ACTUAL RESTORATION OF INJURED RESOURCES

11.A. Description of Actual Restoration of Injured Natural Resources

As a “replacement” rather than “restoration” project, the East Third Street and South Birch water main replacements do not provide actual restoration of injured natural resources. Instead the project will “replace” lost resources by reducing water system leakage and thereby extending Anaconda’s available uncontaminated water supplies.

Resource injuries in the Anaconda area are significant, and primarily related to groundwater. The contamination zone even extends into portions of the proposed project corridors (see **Figure 3** in Step 3 - Technical Narrative). The proposed water main replacement project will occur within the urban area of Anaconda where municipal water service has been historically provided, protecting residents from groundwater contamination.

11.B. Description of the Extent Injured Natural Resources Will Be Restored

No direct restoration of the injured resource will be provided by the project. Instead, a beneficial mitigation to offset groundwater resource injury and loss will be provided by improving safe water utility and availability. By replacing the East Third Street and South Birch water mains, up to 54 million gallons per year of usable water previously lost to leakage will be conserved. This represents a significant offset to the lost utility of the injured water resource.

11.C. Description of Existing Limitations to the Restoration of the Injured Resource

The proposed project is considered a **“replacement project” to rehabilitate and acquire the equivalent of natural resources and/or services lost as a result of releases of hazardous substances by ARCO or its predecessors**. There are no actual restoration components included in this project. As described earlier in Criteria Statement 7, there are severe limitations to the restoration of the injured resources from both feasibility and cost efficiency standpoints – area groundwater contamination has been determined to be technically infeasible to remediate.

Once the proposed project is complete, lost resources will be recaptured and water service will be enhanced to users in the eastern portion of the community. Anaconda-Deer Lodge County is

proposing this project to improve the community's water system, enhance system reliability, and to sustain water availability to meet future needs.

12. RELATIONSHIP BETWEEN SERVICE LOSS AND SERVICE RESTORATION

As mentioned above, groundwater in a 40-square-mile area is affected by mining-related contaminants. Because of the overwhelming cost and work involved in remediating the largest Superfund site in the United States, the USEPA has chosen to cap the waste and allow groundwater contamination to remain without any direct remedial action. This represents **lost services and lost future opportunity** for Anaconda-Deer Lodge County, which relies on clean, untreated groundwater as its sole municipal water supply.

12.A. Description of Services to be Created or Augmented by the Proposal

Due to the demands for sustainable water supply for the community, and the limited options available for development of additional supplies, ADLC proposes to replace 5,670 feet of century-old, leaking distribution mains serving 208 users along East Third Street and South Birch. These

mains serve a critical function as distribution and fire protection infrastructure for residential and commercial water users along these corridors (see **Figures 4A** through **4F** at end of Step 3 - Technical Narrative).

Based on water main leakage evaluated in the 2004 PER, this improvement represents the potential savings of up to 148,500 gal/day or 54 million gallons per year of water otherwise lost to leakage. The savings creates substantial "replacement service" for lost groundwater resources, and significantly augments Anaconda's use of existing uncontaminated water supplies.

12.B. Description of How the Proposed Services Would Restore, Rehabilitate, Replace or Represent the Acquisition of Equivalent Services Lost

The proposed East Third Street and South Birch water project will not only eliminate leakage in this section of the water distribution grid, thereby promoting water conservation, but also improve service with vastly improved system reliability. Less leakage will also promote energy conservation in that lost water quantities pumped into the system will be reduced.

Reduced leakage, estimated at up to 54 million gallons of water per year, represents the acquisition of equivalent new water supply. By curtailing this amount of leakage, an increase of up to 148,500 gallons per day in usable water resources is made available. This is an important contribution to ADLC's water management capability in that options for expansion of its water supply are impaired by widespread groundwater contamination. **Surrogate enhancement of supply by leakage reduction is particularly sensible, given this circumstance.**

13. PUBLIC SUPPORT

13.A. Level of Public Support from Various Individuals or Entities

Anaconda-Deer Lodge County, in conjunction with Anaconda Local Development Corporation and the MSU Extension Services, conducted a *2003 Community Survey*. The results of this needs assessment survey demonstrated strong public support by residents of Anaconda for continued reconstruction of water mains. Results of the survey relative to infrastructure were insightful.

Of 17 categorical priorities for municipal enhancements and improvements, reconstructing water mains ranked fourth, followed by increased water supply as fifth. Only street repair, and community blight and beautification were rated higher. The East Third Street and South Birch water main replacements meet both of residents' water infrastructure goals – old mains will be reconstructed, and in so doing, water supply will be increased.

The survey, conducted in 2003, solicited 500 randomly selected respondents. A 44.5 percent response was received, well exceeding the 27 percent threshold for statistical significance based on population size.

13.B. Letters of Support

A total of 80 letters demonstrating this support are to included in **Appendix G**, and include these testimonies:

Anaconda-Deer Lodge County - Council of Commissioners
Anaconda Local Development Corporation - Executive Director
Anaconda Area Chamber of Commerce - Executive Director
Anaconda Superintendent of Schools
Fred Moodry Middle School - Principal
Dwyer Elementary School - Principal
Lincoln Elementary School - Principal
Anaconda High School - Vice Principal
Anaconda Public Schools - Business Manager/Clerk
Copper Village Museum and Art Center - Executive Director
Business Owners - (7 letters)
Anaconda Residents - (63 letters)

As the project is designed and constructed, community participation will be a key component. Anaconda-Deer Lodge County will formulate and promote a public information process through its Planning Office. The ADLC Chief Executive's role in the project will include liaison with the Council of Commissioners and the citizenry to disseminate information and solicit input.

14. MATCHING FUNDS AND COST SHARING

14.A. Breakdown Indicating Percentage of Total Project Costs (including sources/amounts)

Anaconda-Deer Lodge County	<u>3.16 %</u>	\$ <u>64,079.59</u> (committed “in-kind”)
UCFRB Restoration Funds	<u>96.84 %</u>	<u>\$1,964,262.65</u>

The proposed project budget and categorical cost allocations are further discussed in Step 6 - Proposal Budget.

14.B. Matching Funds (dollars and in-kind)

Anaconda-Deer Lodge County has committed \$64,080 as local match for the project, all of which is “in-kind” services. This consists of \$19,970 in staff services for project administration, oversight, utility repairs, and coordination, representing 941 person-hours over the 12-month project duration.

ADLC has also committed \$38,610 in supplies, materials, and equipment for utility repairs and construction facilitation, plus \$5,500 spent in 2006 for preliminary engineering for this project. Overall, the local match is 3.16 percent of the total project cost. In past years, ADLC has been able to contribute significantly higher match to UCFRB Restoration Funds, but now finds itself in a serious cash deficient position following completion of an audit in February 2006. To restore inadvertently depleted bond reserves and excess coverage on a 1992 issue, all Water Enterprise Fund cash is necessary to meet match requirements on the Seventh, East Sixth and East Eight water main project funded by NRD in 2005. To meet those obligations, ADLC is already having to extend construction of that project over the 2006 and 2007 construction seasons.

To correct such shortfalls in future years, beginning in March 2006, the City-County is setting aside \$10,000 per month from water rate revenues to accumulate towards cash match on future NRD grant proposals. This will provide \$120,000 annually for use as match on future water project proposals to the NRD Program, beginning in 2007.

However this does not help Anaconda’s current financial position, and consequently the City-County is unable to propose any cash match for the East Third Street and South Birch project proposal.

Matching funds sources and “in-kind” services are itemized and discussed in detail in Step 6.

15. PUBLIC ACCESS

15.A. Relevance of Public Access

As a municipal water system improvement, public access is not relevant for this project. Accessibility to public water supply is already provided for all Anaconda residents, subject to

payment of user charges and municipal ordinances governing water use. This status will remain unchanged by the project.

16. ECOSYSTEM CONSIDERATIONS

The proposed East Third Street and South Birch water main replacements does not have direct bearing on conditions in the UCFRB nor the Silver Bow Creek watershed. The project will not affect overall resource conditions in the basin, other than extending the utility of Anaconda's remaining uncontaminated groundwater resources. As a "replacement" rather than "restoration" project, it likewise is not directly addressed in the *Silver Bow Creek Watershed Restoration Plan*. Therefore Criterion 16 is not directly applicable to this project.

Some indirect ecosystem relationships of the project are addressed below.

No ecosystem impacts or impairments are expected from this project. Benefits will include enhanced water resource conservation, and reduction of unnecessary disinfectant and electrical costs in pumping additional quantities of water currently lost to leakage from the East Third Street and South Birch mains.

Safe and ample water supply is a quality of life issue to which Americans are accustomed, and underdeveloped parts of the world envy. American society is reliant on safe water supply for maintenance of our standard of living, prevention of disease, proper disposal of waste, and protection of life and property. As such, municipal water supplies serve a critical role in protecting the entire ecosystem. Relative to the UCFRB, maintenance of the quality of life for Anaconda residents will be promoted by improved reliability and availability of municipal water service.

The project will have no adverse effects to other components of the UCFRB ecosystem. No aquatic, vegetative, or animal species or habitats will be adversely impacted by the proposed improvements, as documented in Step 4 - Environmental Impact Checklist and Narrative. Project activity will be confined to urban utility corridors along and adjacent East Third and South Birch Streets within the Anaconda municipal area, currently occupied by existing water mains.

17. COORDINATION AND INTEGRATION

17.A. Coordination with Other On-going or Planned Actions Besides EPA Response Actions

As the next priority in ADLC's amended water system improvement priorities in the 2004 water system master plan (PER), the project coincides with the ADLC's future water main replacement goals. Amendment of the PER priorities by ADLC Council of Commissioners Resolution No. 06-07 is described in Part A of Step 3 - Technical Narrative (see also **Appendix A**).

17.B. Description of Any Benefits that May Result from this Coordination

Starting with the 1994 project that provided six new supply wells and a 3.5 million gallon storage tank, ADLC has been methodically upgrading its fundamental water infrastructure.

Subsequent projects, included those funded through the NRD Program, have targeted replacement of leaking transmission and distribution mains that provide critical conveyance links between supply/storage and water consumers.

ADLC's 2003 completion of the Main Street 10-inch water main replacement was the first NRD-funded part of this sequence, partly driven by its Federal Aid Urban route status and a Montana Department of Transportation mill-and-overlay project scheduled there. The City-County's 2003 and 2004 proposals to the NRD Program targeted the Fourth Street transmission main, a critical link for water delivery into the community from its well field and storage tank. With these critical transmission links now constructed, Anaconda's focus shifted to the most deteriorated distribution mains in the system – the Seventh, East Sixth and East Eighth Street project proposed in 2005. This is consistent with ADLC's adopted PER (as amended), and the East Third Street and South Birch main replacement is the next priority.

By approaching its water system improvements sequentially, according to priorities established through a comprehensive engineering evaluation (i.e., the PER), ADLC assures that it is maximizing cost-effectiveness in its approach. This approach assures coordination and integration, in that specific projects are coordinated with each other to achieve the overall goals and priorities established in the PER. It also promotes integration, in that all aspects of Anaconda's water infrastructure are addressed – e.g., transmission mains, distribution mains, hydrants, and user service connections.

The sequential approach also assures that the most critical system needs are addressed first, and that annual construction disturbances are confined to localized work corridors.

18. NORMAL GOVERNMENT FUNCTIONS

18.A. Normal Government Responsibility

Operation and capitalization of municipal water systems is a local government responsibility, traditionally funded through user rate revenues as an “enterprise fund.” ADLC's currently operates its Water Department and water utility infrastructure on a \$1.4 million annual budget. This budget, funded by rate revenues, provides for repayment of 1992 revenue bonds, operator salaries, materials and repairs, and was intended to afford a modest reserve account contribution. In the wake of a City-County audit completed in February 2006, cash allocations in the Water Enterprise Fund were found to be inadequate for prescriptive bond reserves and excess coverage requirements on the 1992 bond issues (Newland and Company, P.C. audit report to be published by March 31, 2006, and will be made available to the NRD Program upon request).

This places Anaconda's water utility in a severely strained financial position, and forces it to reassign large portions of its cash on hand and forthcoming rate revenues to bond reserves and excess coverage. This situation has preempted any ability by the City-County to make a cash match contribution towards the East Third and South Birch water project grant proposal.

Additionally, local bonding capacity is maximized, the current 750-mil levy is high, and water user charges are projected to exceed MDOC Affordable Target Rate in 2008, at the end of a three-year phased rate increase enacted in September 2005 (see Part A.3 in Step 3 - Technical Narrative). While ADLC is able to meet current system operating expenses within its water

utility budget, **no further capital improvements projects are currently financially attainable without UCFRB Restoration Fund assistance.**

To improve its water utility's financial capacity, beginning in March 2006, the City-County is setting aside \$10,000 per month from water rate revenues to accumulate towards cash match on future NRD grant proposals. This will provide \$120,000 annually for use as match on future water project proposals to the NRD Program, beginning in 2007.

The City-County has identified over \$10 million in water system upgrades that remain needed over just the next six years. Anaconda direly needs grant support from the NRD Program. ADLC's water infrastructure and related financial needs go beyond "normal government function" for several reasons:

- ADLC inherited a vastly substandard public water system from the Anaconda Company's successors in 1991, with **capitalization needs of over \$25 million.**
- The Anaconda water rate base has **only approximately 2,750 user connections.**
- **Capitalization needs amount to over \$9,000 per user connection in Anaconda's system!** This is due solely to lack of capitalization by past owners of the water utility, a circumstance well beyond the City-County's control. Such a contribution far outstrips normal capital commitments that are expected of water users in Montana communities.
- In the absence of widespread groundwater contamination, ADLC could have less expensive options for expanding its water supply – specifically supplemental wells if available may be developable at less cost than full scale main replacement. **Anaconda faces very non-typical constraints, between lack of available water supply and severely deteriorated mains.**

18.B. Necessity of Restoration Funds

This project proposal is not affordable to the ratepayers without financial assistance from the UCFRB Restoration Fund. **Water rates have increased almost threefold since 1992 with the new rates adopted last year, and will exceed MDOC Affordable Target Rate by 2008** (see Part A.3 in Step 3 - Technical Narrative). Further rate hikes at this time invite financial hardships for ADLC residents, where "Low and Moderate Income" households have increased over the last decade from 37 to 44.3 percent!

Alternate sources of funding assistance for municipal water improvements must typically be matched with debt, which ADLC is unable to currently incur. Grant funding most typically used for municipal water projects include:

- Treasure State Endowment Program (TSEP): \$750,000 maximum.
- DNRC Renewable Resource Grants and Loans (RRGL): \$100,000 maximum.
- Community Development Block Grant (CDBG) program: \$450,000 maximum.
- USDA - Rural Development (RD): 25-45% grant and 75-55% loan combinations.

Access to these sources of funding is limited for ADLC. RD gives priority to communities of less than 5,000 population, and requires full system metering. TSEP and RRGL biannual grants are subject to legislative approval, and absence of water metering may rank Anaconda non-competitive. While new construction in Anaconda must be metered since February 2004, the lack of system-wide metering remains a deterrent for assistance from these programs. ADLC has rescheduled metering for 2009, after which these programs may be more accessible, but this improvement will cost an estimated \$2.1 million (see PER Table 7-1 reproduced in **Appendix B**). Annual CDBG grants are limited to recipients with over 51 percent “Low and Moderate Income” households, a threshold Anaconda does not meet in *Census 2000* data.

Relative to ADLC’s inability to incur additional debt, current mil levies (750 mils) are near the maximum allowable for the property tax base, negating the use of general obligation bond financing for water system improvements. Further Water Enterprise Fund revenue bond financing of system improvements is limited for now per recent audit findings of inadequate bond reserves and excess coverage on 1992 issues, requiring reallocation of available cash and rate revenues to meet these requirements.

This simple fact remains: **ADLC’s lost water resources from decades of mining and smelting are not self-imposed hardships. Rather they reflect a corrective obligation, eligible under the UCFRB Restoration Fund.**

STAGE 2 Land Acquisition CRITERIA

Not applicable. (No land will be acquired for the proposed project.)

STAGE 2 Monitoring and Research CRITERIA

Not applicable. (No research elements are involved with the proposed project. The only monitoring component of this proposal is tied to judging the project’s effectiveness, and comprises less than one-half percent of the budget. See Part F - Monitoring Plan in Step 3 - Technical Narrative, and **Table F-4 in Appendix F**.)

Step 6. Proposal Budget

Applicant Name: Anaconda-Deer Lodge County

Project Title: East Third Street and South Birch Water Main Replacements

A. BUDGET ESTIMATE

The Project Budget Detail and Summary Forms appearing at the end of this section provide an itemization of the estimated **total project cost of \$2,028,342.24** for the East Third and South Birch water main replacements. A detailed project construction cost estimate for the project, prepared February 17, 2006 by Morrison-Maierle, Inc., appears in **Appendix F (Table F-3)**. Costs are based on the preliminary design prepared in January/February 2006 for the project (**Figures 4A** through **4F** at end of Step 3 - Technical Narrative). The current estimate represents a refinement and significant update of the original \$971,008 project cost estimate (\$748,000 + \$89,600 x 5-yr inflation at 3% per year) shown in the 2004 PER (see PER Table 7-1 reproduced in **Appendix B**), plus the addition of the South Birch booster station not included therein.

Construction costs have been estimated based on unit prices received on the Main Street, East and West Fourth Street water main improvements, and other similar utility projects statewide. Bid tabs for the West Fourth Street project let in 2005 appear in **Appendix E**. (Bid results for the 2005 NRD-funded Seventh, East Sixth and East Eighth Street Schedule I project will not be available until after the March 17, 2006 bid opening.)

The East Third and South Birch project design will be completed over the winter of 2006-2007, with construction in 2007. Expenditures forecast on the Budget Forms are all anticipated to occur in 2007, other than in-kind sums already spent by ADLC for preliminary engineering.

The costs provided below are for budget purposes only, and actual project costs will be based on competitive public bids received for the construction work. Professional services for engineering design and inspection will be selected and contracted by ADLC.

ADLC is proposing a local in-kind match of 3.16 percent of the total project cost. This proposed local match consists of \$19,970 of in-kind labor including wages and fringe benefits for staff to administer and oversee the project, the recent expenditure of \$5,500 for preliminary engineering, plus \$38,610 in additional supplies, materials, and equipment provided by the City-County. ADLC's in-kind match is itemized in the Budget Detail Form and **Table F-2** (see **Appendix F**), and includes \$5,500 already expended 2006 on preliminary engineering for this project.

The following expense categories include all aspects of the proposed project budget. Categories to be funded with the requested UCFRB Restoration Funds are specifically identified.

1. **Salaries and Wages:** \$ 15,601.63

ADLC has committed 941 hours of staff in-kind as a portion of its local match towards this project. This amount represents anticipated time to be expended by City-County staff for project administration, fiscal management, construction coordination, ADLC-

owned utility repairs, and inspection oversight. The City-County will utilize ten of its employees on this project. The anticipated commitments for each are summarized in **Table 6-1**.

Table 6-1 - Anticipated Staff Commitments

Personnel	hourly rate*	hours	value
Planning Director	\$15.91	48	\$763.68
Clerical Support - Planning	\$10.53	24	\$252.72
County Attorney	\$16.31	8	\$130.48
Chief Executive Officer	\$25.57	6	\$153.42
Water Superintendent	\$16.89	120	\$2,026.80
Water System Operator	\$16.25	288	\$4,680.00
Streets & Roads Superintendent	\$17.87	160	\$2,859.20
Streets & Roads Laborer	\$16.46	200	\$3,292.00
Fire Chief	\$21.39	7	\$149.73
Street Lighting Superintendent	\$16.17	80	\$1,293.60
Total:		941	\$15,601.63

* Hourly rate excludes fringe benefits at 28%.

2. **Fringe Benefits:** \$ 4,368.46

In addition to the above-referenced Salaries and Wages, Anaconda-Deer Lodge County's employee benefit multiplier is 28 percent. Based on this percentage, fringe benefits amount to an additional \$4,368.46 (\$15,601.63 x 28%).

The combination of salaries and wages, plus fringe benefits results in a total local staff labor commitment of \$19,970.09.

3. **Contracted Services:** \$ 1,969,762.65 (\$1,964,262.65 UCFRB Restoration Funds)
(\$5,500 ADLC payment of Prelim. Engr.)

A task itemization of contracted services is presented in part C.4 of the Step 3 Technical Narrative, and includes – engineering consultant preliminary and final design and inspection; contractor services for construction labor, materials, and equipment; and consultant services for the Monitoring Plan leakage evaluation. Construction and engineering costs are itemized in **Table F-3**, and the leakage evaluation cost is itemized in **Table F-4** (see **Appendix F**). A summary of those estimates is described below:

Professional Services – Anaconda-Deer Lodge County will utilize procured professional engineering services to design the water main replacements, and to provide engineering inspection services. Additionally ADLC may use the services of a professional grant writer/administration firm to assist with administration and progress reporting to the NRD Program. The estimated contract amount for project engineering design and inspection services, and grant administration assistance is \$255,007.85, or 15 percent of construction plus contingency cost. Additionally ADLC has recently expended \$5,500

for professional services for preliminary engineering to prepare design layouts (**Figures 4A through 4F** at end of Step 3 - Technical Narrative), and better define project costs based on exact quantity take-offs (**Table F-3**). ADLC will also utilize an engineering consultant in 2008, following construction completion, to conduct the Monitoring Plan leakage evaluation described in Step 3 - Technical Narrative, Part F - Monitoring Plan. The leakage evaluation is estimated to cost \$9,202.50 (see **Table F-4** in **Appendix F**).

Project Construction costs for the East Third Street and South Birch water main replacements – including mobilization, site work, demolition and disposal, new piping and appurtenances, earthwork, paving, and the South Birch booster station – are estimated to total \$1,478,306.35 (construction cost is itemized in **Table F-3** in **Appendix F**). Construction unit prices have been developed by Morrison-Maierle, Inc., based on similar work recently bid for the Main Street and East and West Fourth Street water main projects, plus other similar utility projects statewide. The 2005 bid tabulation for the NRD-funded West Fourth Street water main project is included in **Appendix E**.

Construction Contingency, at 15 percent of the construction cost, is estimated at \$221,745.95. A contingency of 15 percent is being used due to uncertainty in the extent of RCRA hazardous materials to be encountered during construction, and given recent substantial inflation in heavy construction costs. Preliminary engineering has recently been completed, although the field survey, geotechnical investigation, and Phase I environmental assessment for design have not yet been performed. These tasks will be conducted in conjunction with final design, once ADLC procures a design engineer for the project.

4. **Supplies and Materials:** \$ 35,109.50

As part of its local in-kind match, ADLC is proposing to provide an additional \$35,109.50 in supplies and materials towards the project. This includes making the ARCO Repository accessible to the construction Contractor for disposal of anticipated RCRA waste materials excavated (creosoted ties and adjacent contaminated soils) at crossings of the old streetcar rail bed, values at \$19,466.66. Additionally ADLC will provide clean replacement fill to the Contractor for use in those areas, valued at \$973.34. The City-County will also provide \$100 in replacement topsoil from ARCO's stockpiles for use atop boulevard water service connection excavations at an estimated 15 yards along the East Third corridor that have been remediated under the Community Soils program. (See **Table F-2** in **Appendix F** for itemization of these in-kind costs.)

Anaconda's Historic Street Lighting staff will remove, modify, and reset light fixture poles where required for the Contractor to relay water service connections in the boulevards of East Third Street. ADLC will also replace underground street light wiring along the north side of the East Third project corridor in new buried conduit. Beyond the staff time for this work shown in **Table 6-1**, an in-kind contribution of \$14,569.50 in City-County materials is required as itemized in **Table F-1** (see **Appendix F**).

5. **Communications:** \$ _____ 0
6. **Travel:** \$ _____ 0
7. **Rent and Utilities:** \$ _____ 0
8. **Equipment:** \$ _____ 3,500.00

As part of its in-kind match, ADLC is installing a new ultrasonic influent flowmeter on the Parshall flume at its wastewater treatment plant to measure sewage flows arriving at the facility. This estimated \$3,500 equipment replacement is part of an overall \$300,000 (approximate) upgrade at the plant headworks. The new influent flowmeter will be critical to collection of accurate data on sewage flows during the winter of 2007-08 to use in the post-project(s) leakage evaluation on Anaconda's water system following five years of main replacements (see Part F - Monitoring Plan in Step 3 - Technical Narrative). The new flowmeter will be bid as part of the headworks improvement package in late summer 2006, and the \$3,500 installed equipment price is based on the design engineer's estimate at this time (*pers. comm.* Alden Beard, BETA, with Brad Koenig, P.E., Project Engineer, Robert Peccia & Associates, February 9, 2006).

9. **Miscellaneous:** \$ _____ 0
- TOTAL:** \$ **2,028,342.24**

B. BUDGET NARRATIVE

The following budget narrative demonstrates that the proposed East Third Street and South Birch water main replacement project can be completed within the proposed project budget.

B.1. SPENDING PLAN AND BUDGET ITEMS

The City-County proposes to leverage \$5,500 in preliminary engineering expenditures and \$58,579.59 in additional "in-kind" match with a requested \$1,964,262.65 in UCFRB Restoration Funds to achieve this much needed infrastructure upgrade. Proposed funding for the project represents an allocation of **3.16 percent ADLC local match and 96.84 percent UCFRB Restoration Funds.**

While Anaconda's water rates are keeping pace with statewide norms (see discussion in Part A.3 - Ongoing and Past Efforts in Step 3 - Technical Narrative), it finds itself in a serious cash deficient position this year following completion of an audit in February 2006. Only approximately \$125,000 is currently available for capitalization in the Water Enterprise Fund, all of which is already committed towards the \$225,000 cash match needed for the 2005 NRD grant on the Seventh, East Sixth and East Eighth water project. This cash shortfall was not known at the time of the 2005 NRD grant application, and prompted rescheduling of that project from one to two construction seasons to allow additional accumulation of rate revenues.

This situation results from recent audit findings showing deficiencies in bond reserves and excess coverage required on remaining debt from the 1994-95 system improvements (Newland and Company, P.C. audit report to be published by March 31, 2006, and will be available to the NRD Program upon request). Substantial cash thought to be available in the Water Fund plus part of future water rate revenues must be assigned to restore reserves and excess coverage required. While these set asides are not lost to the City-County, they must remain in escrow until retirement of the 1992 water bond in 2012.

This leaves ADLC in the unfortunate position in 2006 of having no cash to contribute as local match for this grant proposal. Alternatively, the City-County is proposing a combination of recent expenditures for professional services for preliminary engineering on the project and in-kind staff services as match for the East Third and South Birch water main replacements. **To correct cash shortfalls in future years, beginning in March 2006 the City-County is setting aside \$10,000 per month from water rate revenues to accumulate towards cash match on future NRD grant proposals.** This will provide \$120,000 annually for use as match on future water project proposals to the NRD Program, beginning in 2007.

Likewise ADLC is not contemplating any “in-house” water main construction in proximity to the project corridors, that could be claimed as an additional match contribution for this year’s project. The City-County is nonetheless desperate to implement the project in 2007 to maintain progress on its adopted main replacement priorities, and “stay on schedule!” With seven more years and 45,825 feet of additional main replacements identified in the PER after this project (PER Table 7-1 reproduced in **Appendix B**), it is **critical for ADLC to avoid protracting this project and the resulting slippage to its overall water main replacement schedule!**

Anaconda-Deer Lodge County believes the project-related costs are justified considering the relationship between service needs and resources lost. Of the five counties involved in the Clark Fork Natural Resource Damage lawsuit, **Anaconda-Deer Lodge County has experienced the greatest comparative loss of water and land surface resources.** Given the age of its water infrastructure and historical lack of capitalization by past owners, Anaconda struggles to continue modernization of its system. ADLC is requesting UCFRB Restoration Funding to promote essential conservation of its finite water supply, and provide an effective offset for lost resources.

[Note: Budget items shown on the Budget Detail Form at the end of this section are explained in the preceding discussions under each category in Part A, Items 1 through 9.]

B.2. BUDGET ASSUMPTIONS

Assumptions made for the budget in this proposal are well-founded and defensible, and include the following:

- The traditional approach to municipal utility project will be used – i.e., design plans and specifications will be prepared by a Professional Engineer and used as the basis for competitive construction bidding. Professional services costs and bid pricing are anticipated to follow industry norms for water main replacement projects.
- Project construction will be bid in April 2007, and completed in that construction season.

- Given the already completed preliminary engineering design (see **Figures 4A** through **4F** at end of Step 3 - Technical Narrative, and construction cost estimate in **Table F-3** of **Appendix F**), and a thorough design survey and geotechnical investigation yet to be completed, construction change orders are assumed to be manageable within the 15 percent Contingency allotted.
- Limited creosote-based hazardous materials will be encountered when 102 water service connections and five connecting water mains are relaid across the old streetcar rail bed in the center of East Third Street. This will generate 1.78 cy (6 ft. x 4 ft. x 2 ft.) of waste per service line, and 2.67 cy (6 ft. x 6 ft. x 2 ft.) of waste per water main crossing, both requiring RCRA-compliant disposal in the ARCO Repository. Equivalent cost of this disposal privilege is estimated at \$100 per cubic yard, and is being proposed as part of ADLC's in-kind match. Clean replacement fill for contaminated materials will be provided by ADLC at an estimated value of \$5 per cubic yard, as additional in-kind match.
- Fifteen residential yards along East Third Street are assumed to have been remediated under the Community Soils program, and their respective boulevard areas will be disturbed for new water service installations (to the property line). ADLC will arrange access to ARCO topsoil stockpiles for the Contractor, as an in-kind contribution valued at \$100 (or \$10 per cubic yard).
- Based on a similar crossing on the NRD-funded East Fourth Street transmission main replacement, new water main installed on East Third Street beneath the Rarus Railway Company tracks will require boring and installation of a steel casing to house the main.

B.3. COST ESTIMATE SOURCES

Cost estimates for the budget were obtained from the following sources: (Itemized estimates appear in tables in **Appendix F**.)

- Preliminary Engineering Professional Services – current contract between Morrison-Maierle, Inc. and ADLC.
- Project Construction Cost Estimate (**Table F-3**) – developed by Morrison-Maierle, Inc. based on that firm's February 2006 preliminary engineering design (**Figures 4A** through **4F** at end of Step 3 - Technical Narrative), and bid tabulations for 2003 through 2005 Anaconda main improvements plus other similar projects statewide.
- Engineering Design and Inspection Cost Estimate (**Table F-3**) – developed by Morrison-Maierle, Inc. as a percentage of the preliminary design construction cost.
- ARCO Repository Haz-mat Disposal, Replacement Fill, and Topsoil (**Table F-2**) – estimated by Alden Beard, P.E., at Beard Environmental & Technical Assistance, LLC (BETA).

- ADLC Historic Street Lighting Repairs (**Table F-1**) – compiled by BETA based on unit prices developed by Jim Novak, ADLC Historic Street Lighting Supervisor (see unit price sheets following **Table F-1** in **Appendix F**).
- Monitoring Plan Leakage Evaluation (**Table F-4**) – estimated by Alden Beard, P.E., at BETA.

B.4. EXPENDITURE JUSTIFICATION

Project expenditures shown on the Budget Detail Form are all supported by itemized cost estimates from qualified sources as described in the preceding section. All tasks and cost shown on the budget form and supporting itemized cost estimates are necessary for the successful completion of the project.

Professional services for engineering design and inspection are required under state law and MDEQ *Circular DEQ1*. Conduct of the Monitoring Plan leakage evaluation was recommended to ADLC by the NRD Program, and requires similar Professional Engineering services to promote qualified findings to compare with the baseline leakage identified in the 2004 PER.

Construction costs must necessarily be incurred to build the project. City-County staff services are necessary for project management, and coordination and preservation of Anaconda's utility infrastructure.

Other in-kind costs for RCRA waste disposal and replacement soil materials are required, given apparent creosote contamination from buried ties along the old streetcar rail bed on East Third Street.

B.5. COMPUTATION BASIS

The aforementioned cost estimates prepared by Morrison-Maierle, Inc. and BETA to support the proposal budget are each itemized in detail to assure accuracy. Construction and related in-kind costs, and the Monitoring Plan leakage evaluation estimate are based on estimated work quantities and unit prices representative of the various types of work. Engineering design and inspection costs are estimated on a percentage-of-construction basis, pending selection and contract negotiation with a consultant.

B.6. COST CONTINGENCIES

A Contingency of 15 percent of construction cost is included in the Budget Detail Form (see also **Table F-3** in **Appendix F**) to cover any unanticipated cost overruns and assure completion of the project within the budget. The Contingency is intended to cover any construction change orders due to underground utility conflicts or unforeseen conditions. The Contingency is also included to offset uncertainties in the extent of RCRA hazardous materials that may be encountered along the corridors, and recent substantial inflation in heavy construction costs.

B.7. FINANCIAL ASSURANCES

ADLC is hereby providing its assurance that it will provide the in-kind match proposed on this project. That match will be tracked regularly throughout the course of the project, and supporting measurements and documentation will be generated. In-kind match will be reported to the NRD Program with each project Progress Report submission.

In recognition of its current temporary fiscal constraints, ADLC is not proposing a direct cash match in this grant proposal, as discussed previously under Item B.1. Hence the only financial assurance the City-County can provide is its commitment to manage the project within the proposed budget.

Contractor performance on the project will be assured by his/her Performance Bond and Labor and Materials Payment Bond, each required in the amount of 100 percent of the construction contract amount.

(Insert Project Budget Detail and Summary Forms here – 4 pages)